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The Magazine for Bright Sparks !

electronics - science - radio

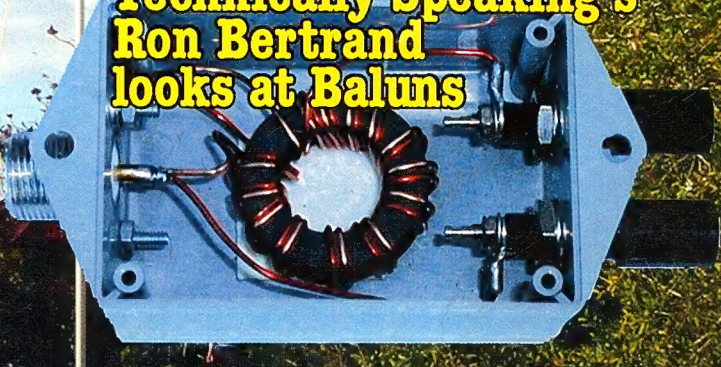
ACA Discussion Paper
Lighthouses On The Air
DC to Daylight - Military Scanning
RX-340 Professional Receiver
Making Baluns that work

Nick Baker
VK2HUB

Ten Tec Rx-340

Pure Indulgence!

Technically Speaking's
Ron Bertrand
looks at Baluns



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TTS Systems

AT-1000 Autotuner

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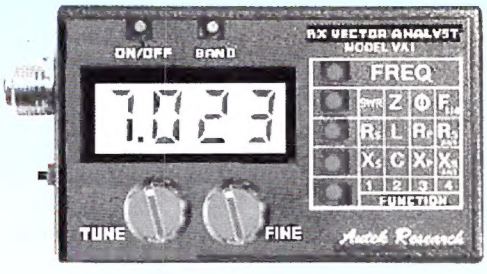
see the REVIEW in this Issue



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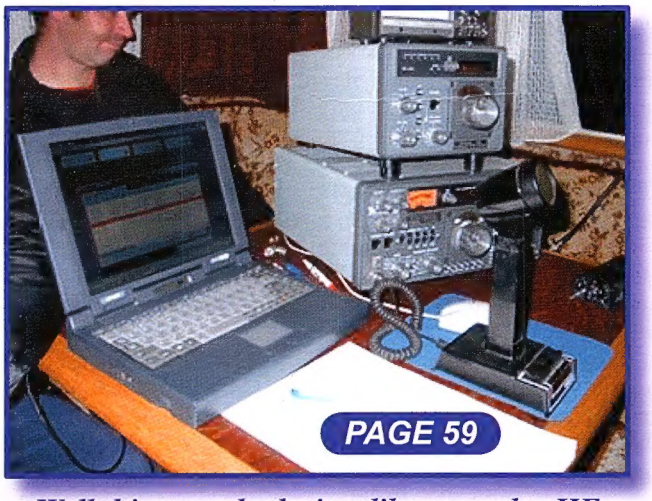
ESR

"Professional" may be a catchy adjective, but when placed in front of the word "Receiver", I'll bet it gets your attention!

Why not take a flypast for a look at one clubs field station, for the annual Lighthouses On The Air contest.



Well this setup looks just like a regular HF station, except it's a field station being used in the CB World Wide Field Day contest!

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72 The ESR Radio Crossword. NOTE: the September crossword had something terrible happen to it. Sorry!

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by Bob Harper VK4KNH

Thanks for the feedback from #1 mainly from those who were sent early copies, mainly contributors and advertisers, who have voiced their approval. I hope they're representitive of the remainder of you. There will be some fine tuning and some "exploratory" materials but generally the magazine will remain in this basic format for the remainder of 2003 at least. The survey will hopefully tell me what you want.

The Big News

The ACA have released a discussion paper that must be answered by the end of this month -31st October 2003. I have downloaded a copy and read it through, but as I can't print the whole thing, I'll go through it in this issue and add my thoughts on the future of AR in Australia.

Please do read the article, access and read the document if you can, and let the ACA know your thoughts. I am sure the WIA will be making representations but they have very little time to seek thorough membership views, and to organise a balanced concerted response.

Apart from that there are almost three times as many amateurs that are non-WIA members and many who would be amateurs if there were no CW test, who may feel that the WIA would not represent their needs at all.

To be fair, I think the WIA do try to represent the whole of the radio community to the best of their ability, but are missing feedback from a proportion of the community they mean to represent.

CB Radio and the ACA Paper

CBers and others who may like the idea of being a radio amateur should also read the document and present their ideas as potential foundation licencees.

I'll explain my reasoning later but to raise some eyebrows... CBers are already foundation radio operators as they are already learning radio operating skills and technology -and I believe that CBers should be recognised as such.

Meanwhile Amateurs often fail to realise that they are all licenced CBers whether they like it or not -it's a class licence open to all Australians! Maybe, as we were so keen to have a common band for all amateurs, we should evaluate joint occupancy of the 11m band.

Foundation Licences

The ACA paper has displaced a planned article on the Foundation Licence, until next month. The ACA paper has to be responded to by the 31st of October, so it had to go in this issue in order to raise your awareness to it.

I already believe that the CW requirement will be dropped, as it has been in the UK, Switzerland, Belgium and recently in Germany as well. It's a matter of how long the ACA will take to think about it first.

What I was more interested in was the way the ACA want to handle Interference, which appears to be that we are guilty until proven innocent, and worse still, that we could cop the expense of repairing a neighbours poorly designed, cheaply imported HiFi or TV, if a well designed transmitter should happen to transmit a clean carrier right up it's front end.

There is more consumer equipment made available every day, mostly imported, mostly designed to a basic price, mostly operating with RF frequencies inside, and mostly susceptible to any nearby RF source.

I know it is common courtesy to shut down until the cause of the interference is found, but now it appears we will be expected to shut down until the interference is cured and possibly at our own expense, even if the station concerned is transmitting a clean signal.

Apparently, the almight cash cow, the consumer, must be protected at any cost.

Subscriptions

I have received a few emails and phone calls asking whether I will honour the subscriptions that people had with R&C. I understand the confusion and wish I could have avoided any, but ESR is not in any way financially responsible for R&C's debts. We all sympathise with those who lost money, as most of us at ESR lost as well, but I am the only person with a financial investment in ESR, and I had no investment in R&C. ESR and R&C are two separate bodies.

On ESR subscriptions, I was not going to offer any for the first three months, but had requests long before the first one was available. I have yet to have a Credit Card Facility set up, so cannot accept Credit Card payments yet. Hopefully it will be set up by the time you read this.

Survey

I am pleased with the number of survey responses so far. Most have been very helpful and there have been some great suggestions. Mind you, the number of people who think we should have a centerfold is interesting, but four want the centerfold to be a radio! OK, I'll keep it in mind!

Until next month
- Bob Harper VK4KNH

Last Minute JOTA Ideas

Every year it's the same... you pack up your radio gear at the end of the JOTA weekend, and tell yourself that next year you'll have some fresh ideas to fall back on when the ionosphere doesn't play ball and give the kids some decent DX contacts.....and before you know it, JOTA is again fast approaching and you have done nothing about it, and panic sets in.

This has been a recurring theme at my local club, and probably many others as well! If this describes your preparations for this year's JOTA, then perhaps these suggestions might get your creative juices flowing:

A fox hunt is a good radio activity for the kids, giving them the chance to burn up some excess physical energy as well. Trouble is, not many of us have ARDF (amateur radio direction finding) equipment in our shacks, nor have the time to home brew it between now and JOTA.

Last minute idea: have a fox hunt without the fox - a kind of virtual "treasure hunt". Set up a "course" in a small field, with a number fixed points containing a "treasure" (it needn't be a real object, just a card with the name of the treasure on it will do if you're really stuck.)

Scouts/Guides work in pairs: one, at the "base", has a map of the treasure locations, and gives directions over the radio to his/her partner, who must navigate the course and "collect" treasures in a particular order (i.e. radio back the name of the treasure at the location).

The runner has no map, and doesn't know what objects must be "collected" or in what order - they must be guided by the base operator, by whatever means they like. First to collect all (say ten) treasures wins the round.

Say, maybe, three teams operate at a time. Each team working from the same map, but collecting objects in a different order. First team to find all the treasures wins.

This game can be played with 2m or 70cm handhelds, CBs, even LIPDs. The range needn't be far, as the base operator would have to see the runner to guide him.

The teams would presumably operate on different channels, but some enterprising players might find some competitive advantage in covertly monitoring the competition!

This activity doesn't require any special gear; the mechanism to hold the treasures can be as simple as a rock on a piece of paper, possibly marked with a flag.

Game variation: with one controller and one runner, the game could leave the other kids getting bored, so teams could be set up to rotate players. For example, Once a runner finds a treasure, he returns to be controller for the next runner, and so on.

The other players can plot the best course for the next runner while they wait their turn.

The old children's game of Battleship can take on a novel twist by putting the players in separate areas of the campground and passing targetting coordinates via radio (I'll admit I saw this on "Malcolm in the Middle" on TV last week!) Of course, this game can be played with other scout groups too, via repeater or simplex link.

This can be played of course with the commercially available game, or just on paper. For those not familiar with it, each player marks a 10x10 matrix on a sheet of paper and places "ships" on horizontal and vertical sections of it. A battleship occupies 5 squares, a aircraft carrier, 4 squares, cruiser three squares, and destroyer two squares. The players can agree on the number of ships or the size of the matrix as well. Each player takes turns firing at the other player by announcing coordinates, eg "G-7", and the opposing player announces whether the shot was a hit or a miss. The winner is the first to sink all the opponent's ships.

For the younger kids, the old hunting game of "you're getting warmer...warme r...colder" can be played via radio. Many other common games (especially those that involve shouting!) can be adapted for the radio. The only limits are those of your imagination!

73 Richard VK2SKY

The Ten-Tec RX-340 Monitor Receiver

How do I even begin to describe this radio? To be honest, this receiver would take a while to get to know properly. (ie can I borrow it for a year or two??)

First, take a look at the photo. If it looks like a professional piece of equipment to you, then you begin to understand what it looks like in "person".

It is a full 19" width 3U rack mount receiver made from real metal -though so light it must be all aluminium, anodised to look like Cadmium plating, –perhaps it is plated? Either way it's all metal back, full of ventilation holes looks so good that I'd have no qualms leaving it on my shelf (Hear me Dave! Hi Hi!)

The front panel is likewise business like, a true commercial quality piece of equipment. The lack of knobs might put some off. I have to admit that I kept wanting to hold it, to drive it like a sports car, but had to be content just to look and listen to the astonishing sound quality.

Panel Layout

Either side you can see the large rack handles which double to protect the panel should you lay it face down. (Why would you do that?) I guess they are also a safe way to carry it around -when you need to.

Starting at the top left, there is a small power switch, the RX-340 does of course work on 240volts (90-264V @ 48-450Hz!) and as a receiver the power drain is a low 30W. So having such a small switch seems sensible, after all, it takes a lot of effort to convince yourself to turn it off.

Beside the power switch is what looks like a signal strength meter. Well it is, but not the usual "maybe 9+20dB" type but an absolute scale signal strength meter, calibrated in μvolts and dB.

Below the meter are the two volume controls, one for the speaker/audio out level, and the other for the headphone level so you can monitor while recording for example, without disturbing the record settings.

On independant sideband signals, and even on AM according to the manual, I didn't check, you can select upper, lower, or both sidebands with a simple push button. A 1/4" stereo jack is provided on the front panel to accept a standard stereo headset for personal monitoring. This is one of the few receivers I have listened to, that actually deserve one!

Beside the volume controls to the right is a button to put the receiver into RS232 Remote control. I didn't try remote operation but a number of receivers may be placed in a rack and driven by a single computer via an RS232 multidrop cable.

Can you imagine having a rack full of these receivers?

Auxiliary Parameter Panel

The middle (if not center) panel has two controls and readouts. The top one is known as the Auxiliary Parameter Panel. On it you can control the Receiver IF Bandwidth from 100Hz up to 16kHz. It feels like a continuous adjustment but a close look reveals that the bandwidth is reduced in steps.

I tuned in a SW AM station and set the bandwidth to 16kHz. You guessed it, way too much with a lot more noise than was necessary. The Asian female voice however did actually sound just like a local AM BC station which may have meant that the station had a better than usual transmitter, but I suspect that the RX-340 can be credited with the quality.

As the bandwidth was tuned up and down, around 9kHz seemed to be the best compromise between noise and quality. On another station, 12kHz seemed best, while a mostly voice station was easiest to understand at 6kHz. That was an interesting experiment in itself and an eye opener to what DSP is capable of. (OK so my usual set is two baked bean cans and a piece of string, but I own them!)

Tuning in a CW station, I found that I could tune down, down, down to 100 Hz, and of course he was still there. I found out, now that the receiver has been sent back, that I could have set the bandwidth in Hz by typing it into the keypad!

While in CW, the BFO can be set from -8kHz to +8kHz. I guess that allowing a BFO frequency above or below the signal is useful to avoid interference. If for example an interfering signal is say 800Hz one side of your signal, you could choose the other side. I'm not sure if I am right about that, but I think I'm on the right track.

The RX-340 also has Pass Band Tuning, PBT, which can be used to "push the signal up against the wall of the filter" to help cut out interference from another signal. To be honest I can't remember using it as the signals were already just about interference free.

The AGC can be set to fast medium or slow, which seems pretty simple, and even standard, but then I spotted that I could tailor my own AGC.

Using the Auxiliary panel I could set my own AGC parameters with adjustable Attack Rate, Hang Time and Decay Time. Attack and Decay can be set to between 0.01 and 99.9 dB/Second! The Hang time can be from 0 to 99.9 seconds!

Unfortunately having played with the AGC briefly, I heard a station I wanted to listen to and switched back to fast AGC, and forgot to go back to play with it again.

There is also a dump button so if you have a long duration AGC set, and you are listening to a lower level station, a high power station drops a bucket of bolts on the floor, you can dump the AGC back to the level for the lower station by pressing the dump button. Magic!

Still on the Auxiliary panel, the Notch control, which works on CW or SSB modes, can be used to cut out a narrow signal, like chopping out a CW signal in the middle of an otherwise clean SSB signal. The Notch can be shifted +/- 2000Hz, but is automatically turned off if the bandwidth is greater than 4kHz.

The Squelch control is very handy for communications reception, though some apparently think it is only useful on a CB or FM radio. On the RX-340 the squelch can be set to a specified signal level, like -100dBm. In fact it can be set from -140dB to +10dBm!

The squelch is the best I have ever heard opening and closing cleanly with an apparently well chosen hysteresis and/or hang time as there was little chopping in and out. Perhaps the AGC was set to a longer delay and I was fooled but I thought it was a very pleasant change to hear a squelch control that worked like it was supposed to.

There was also a noise blanker that seemed to be working fine although, at that time I couldn't find anything to test it on. Maybe I had better move back to the city so I can experience true noise!

I even dashed out to the radio after seeing our Channel 2 TV station with some background noise, but couldn't find the noise on the RX-340. In hind sight, maybe I should have turned on my spike generator type signal injector.

Finally on the Auxiliary Panel, there are two unused buttons, Opt1 and Opt 2. Not much fun you might think but it shows the thought that went into this set. The makers know that the set is programmable, and at some future time, two more functions may be added, in software, to the radio.

Memoery/Scan Panel

Just in a higher frequency scanner, 100 memories can be stored with all the appropriate parameters. You can store the current frequency in a chosen channel number, or in the lowest available channel. You can also store the current channel in a scratchpad, so you can tune for other frequencies, and update the scratchpad or return to the channel stored in it.

Frequencies can be recalled by entering the channel number with the keypad and then pressing recall, or by scrolling through them with the "Edit" knob which is an optical chopper, one on each of the auxiliary panel and scan/memory panels. Memories can be overwritten or cleared.

The RX-340 can scan sections or blocks of frequencies, to search out activity in a band. In fact scan parameters can be set up to suit the operator, and the operation at hand.

To start with the squelch selects the level at which a signal will be noticed. The operator can set how long a signal needs to be active before it is recognised, and then how long it will be recognised before returning to scan mode. The signal can stop the scan entirely so an absent operator will return to find the set stopped at the last heard frequency.

The RX-340 can set the time it will listen for a signal, before scanning to the next channel. This is known as the Gaze Time, which can be set from 0.1 to 29.9 seconds on the RX-340.

The Dwell Time is the time it will listen to a signal before moving on, which is also from 0.1 to 29.9 seconds, and the Dwell Time can also be set to Infinate as mentioned above.

Dead Time is the time the RX-340 will remain on station after a signal has disappeared. Once again up to 29.9 seconds.

Channel Lockouts can be programmed in, for example to lock out an already known or found station. Basically this allows the scanner to sweep a band for unexpected signals while ignoring the expected signals.

The RX-340 can also scan the memories, ignoring unset memories, and can scan between frequency limits which can be set and stored in memory.

Of course, as the RX-340 can be connected to a computer, a program can be written to operate the RX-340 in whatever way the programmer requires. The RX-340 can become a programmable audio recorder similar to a VCR if required.

Main Tuning Panel

Can I honestly call it a tuning panel? I'm an old VFO user and I still notice the stepped frequency changes as a HF rig slides up the band 10 or 100 Hz at a time. It's not that I object to digital, I'm all for it. It's just that as this radio can tune in 1Hz steps the sonic steps disappear, and I'm so used to hearing them, I noticed that it disappeared on the finest step rate. Well it really didn't it's just that I can't pick 1Hz differences!

The steps are actually very well thought out with 1, 10, 100, 1k, 5k, 9k, 10k, 100k and 1MHz steps available, and I don't doubt that more could be programmed in if necessary.

On a dark quiet night, with the RX-340 connected through a home brewed antenna tuner to an 80m dipole, connected to the tuner as a "T-top" MF antenna, and with the RX-340 tuned to a MW station, steps set to 9kHz, the band was full of activity. I remembered all those Sydney and Melbourne stations I had listened to late at night as a young boy. I thought they had all died!

I was impressed that I could tune at almost any rate I wanted to, dial up the bands as MHz and go immediately to them, or dial up exact frequencies in kHz and simply press the kHz button to pull them in.

One minor change I'd like to see, not important but perhaps useful, would be to dial up a CB channel, which for thoise un-familiar with the frequencies all end in 5kHz, and then set the step rate to 10kHz so I could tune up and down the band -on channel. Maybe I could have set it up but I didn't spend much time trying.

From an operators chair, this is one very nice receiver, suitable to monitoring most forms of transmission expected below 30MHz, including I believe, Radio Mondale.

RTTY, AFSK, and others are not in my experience set, but I understand that they can be received by the RX-340 with the digital signal being decoded by an external computer.

The Back Panel

There is, somewhat expectedly, a power cord IEC socket, and 1 amp fuse, which seems hefty if the load is 30W. I'll let you do the maths but a smaller fuse might have been used.

The most noticeble accessories on the back panel are the BNC connectors, one for the Antenna, that's expected, Then there is the 1 Mix Out, Ext Ref, IF Out, 2 Mix Out, and Sig Mon! There is also a Wing Nut for a ground lead, a 6.5mm External Speaker (or 1/4" if you don't have a metric one!) a 25 pin D25 socket for RS-232, and an Audio/Auz 15D socket. Finally there is a 16way DIP Switch Set for setting up the RX-340 configuration. I didn't get a chance to read up on that one!

TEN-TEC

One thing I did do while I had the RX-340 on the bench, was to connect to the various BNC sockets with the CRO to look at the signals.

All nice and clean as would be expected, but then in a moment of inspiration from some unknown source, I set the RF from the IF Out to the Y channel and the Audio to the X channel to create a Trapezoid pattern.

A 100% modulated AM signal would normally show a triangle pattern on its side -eh make that the axis!

That is at maximum AF amplitude the RF makes the triangle base, the amplitude on the right side as maximum, and on lowest AF amplitude the RF makes the triangle form a point on the left.

At lower modulation levels the triangle turns into a trapezoid, or a triangle with it's tip chopped off. You can measure the modulation level that way, and I think the ARRL handbook exlains how.

You can also see how linear the modulation is as the sides of the triangle should be straight. If they are hollow something is wrong! But if the sides bulge out in a curve, then some form of compression is being used.

The RX-340 made it easy to set up and look at these trapezoid patterns, and to check out how much compression is being used.

SSB signals gave a "Pillow Pattern" and I am not sure why as I had seen them before, but perhaps a bit of thought will reveal why.

The point is that the RX-340 allows a snoopy person to look at the signal at an RF level, and even to export it to a Spectrum analyser or a Fast Fourier Transform (FFT) box for display on a Computer.

The Operating Manual

Usually, recently at least, my greatest disapointment with a piece of equipment is the lack of any background information. Some manuals are a waste of paper and others are to say the least, useless. The RX-340 technical manual is everything a user could ask for. It is huge by modern standards, A4 printed double sides and it's still a good half inch thick, –even thicker in metric!

There is a circuit description including parts lists and PCB layouts, circuit diagrams, which I'll get to next, and the best operating manual I have seen in a long while. There is even a chapter on talking to it via RS-232 and how to program it.

Inside

Something unusual for me, I didn't even lift the lid. (Honest!) I didn't have enough time I guess, but also the manual showed me basically what to expect inside, and peering through the many ventilisation slots I could see the high standard of workmanship that we have come to expect from Ten-Tec.

I suppose I was expecting the SMDs to be laid like ceramic tiles but I was pleased to see at least some tuning cans still evident inside.

There are very few jumper wires compared to older radios, but surprisingly they weren't replaced by ribbon cables either. In fact I can't remember seeing one.

I am not sure how many computers are inside it but we can accept that the DSP system is a computer, and another computer controls it and the main circuitry. The front panel appears to have a controller of it's own so I'd suggest at least three computers dedicated to receiving a signal us oldies used to listen to with a pair of diodes and an ex army headset, and had more fun!

Internally it is all compartmentalised, and shielded, with some circuitry even in fully shielded sealed boxes. You might agree that the use of so much digital technology would make it essential to keep the two apart, and Ten Tec have done a fine job at doing so.

Block Diagram

Figure 3-4 of the manual, the Interconnection Diagram should make some interesting viewing for those who are interested, so I've placed it on the next page.

Paraphrasing from the manual -the RX340 has a high dynamic range front end with a versatile DSP back end to provide extraordinary performance and flexibility. Well that's all you need to know right?

(Note for those who chase me over the growing list of acronyms, DSP is a Digital Signal Processor, which is a computer that converts the analogue signal to data, filters it mathmatically, and converts back to an analogue form.)

The signal (50kHz to 30MHz) first goes through one of a set of 8 Preselector Filters spaced from a 1.8MHz LPF to a 22-30MHz BPF. They're listed as 1/2 octave where an octave a doubling in frequency.

RF passes through one of three selectable paths, direct, attenuated, or pre-amplified before reaching the first RF Amplifier. The RF amplifier and first IF Amplifier are balanced parallel elements with two sets of three FETs in push pull to "...preserve 2nd and 3rd order intercept points during conversion".

Prior to the first mixer the amplified RF passes through a 30MHz LPF.

A PLL Synthesiser generates the local frequencies from a very stable 10MHz internal reference or if ultimate frequency stability or accuracy is required, from an external 1, 2, 5, 10MHz reference if preferred.)

The first mixer is a passive balanced mixer to help preserve the signal. The received signal is converted to 45.455MHz signal using a LO of 45.455 - 75.455MHz.

This sounds like you can receive DC and in practice I tuned the displayed frequency right down until the reading was negative. The radio seemed to be receiving 50Hz harmonics and noise from about 1.8kHz right down, but that may have been an illusion as I doubt the RF circuitry would pass such low frequencies.

The second mixer uses a 45MHz LO to convert the signal to 455kHz. The 455kHz 2nd IF passes through a two stage crystal filter with a hard bandwidth of 16kHz to ensure that the 2nd mixer image at 910kHz is denied.

A third mixer converts all signals to a center frequency of 16.666kHz (16 2/3kHz as the US manual states.) which is then digitised in an A/D converter to a 66.666kHz sample rate.

The DSP CPU is an 81807 IC which takes the data stream at 66.666kHz and filters the signal according to the instruction passed to it from the front panel or from the externally connected computer.

(Perhaps there is a place for an article on DSP technology, assuming we have an expert who is interested? Anybody ready to share their wealth of information?)

The data stream leaving the DSP contains both AF and IF data multiplexed together. This data is later demultiplexed to seperate the AF and IF. The IF is made available at the back of the RX-340 while the AF is amplified and fed to the various outputs.

Why a DSP?

The DSP performs many of the previously hardwired functions such as the AGC detection and application, in a way that is far more flexible than ever before. For example DSP allows programming to provide AGC functions not easily implemented in ordinary electronics such as zero decay if you wanted it.

Conceivably, the RX-340 could be made to follow a frequency agile signal by locking to the carrier and drifting with it. I would think that there are many monitoring problems that can be worked around or cured by a radio as programmable as the RX-340.

Summary

Although I had the radio at a time when I could not devote endless hours to it, and it is a radio that I could spend endless hours with if I had the time, I was quickly able to tune in and tweak signals to get the best reception from them.

On the second session I was saving frequencies and modes, bandwidths, Notch and AGC settings, and generally customising the radio for each signal I heard.

By the third time I got to spend some time with it I was monitoring the signal waveforms on the CRO, making trapezoid patterns and comparing AM BC stations on the type and extent of compression they were using.

I finally had to send it back to TTS systems, much to my regret, and get stuck into this magazine. That's when I really had a look at the manual, which I have held back for a few more days, and started to really look at the circuit diagram. Now I'll have to find some time to find out why those amplifiers work so well!

Would I buy one, gulp, is the XYL looking? Yes, if I could justify the professional outlay of $7650. That is to say that I have seen a lot of radios with grand traditions that don't come close to this as a receiver.

I don't think it would suit a HF DXer even with any choice of stand alone transmitter or transceiver to send on, but I think that the well financed monitor would love it.

Being able to use a computer as a remote control, even sharing the computer terminal with many other radios, would make this radio ideal for monitoring a number of frequencies in a professional situation, perhaps military, or police, but also aviation HF, Flying Doctor, Marine Safety, and others I probably don't want to know about.

The RX-340 covers the full range of modes and allows for an update for the introduction of Radio Mondale etc.

It tunes from just above DC to 30MHz in 1Hz steps so it's very much like having a 30MHz VFO, except that for all practical purposes it doesn't drift.

You'd need a well set up lab to prove that wrong as I left it on WWV for over an hour one night with no apparent shift. (Not that that's hard with modern gear!)

If it's out of your preferred range, perhaps you should check out the little brother, the RX-350 which we may review in a future issue.

Reviewed Radio supplied by TTS Systems, 1510 Frankston Flinders Rd Tyabb (03) 5977 4808

Thanks to Dave Wilson!

TEN-TEC

MODEL RX-340 BLOCK DIAGRAM

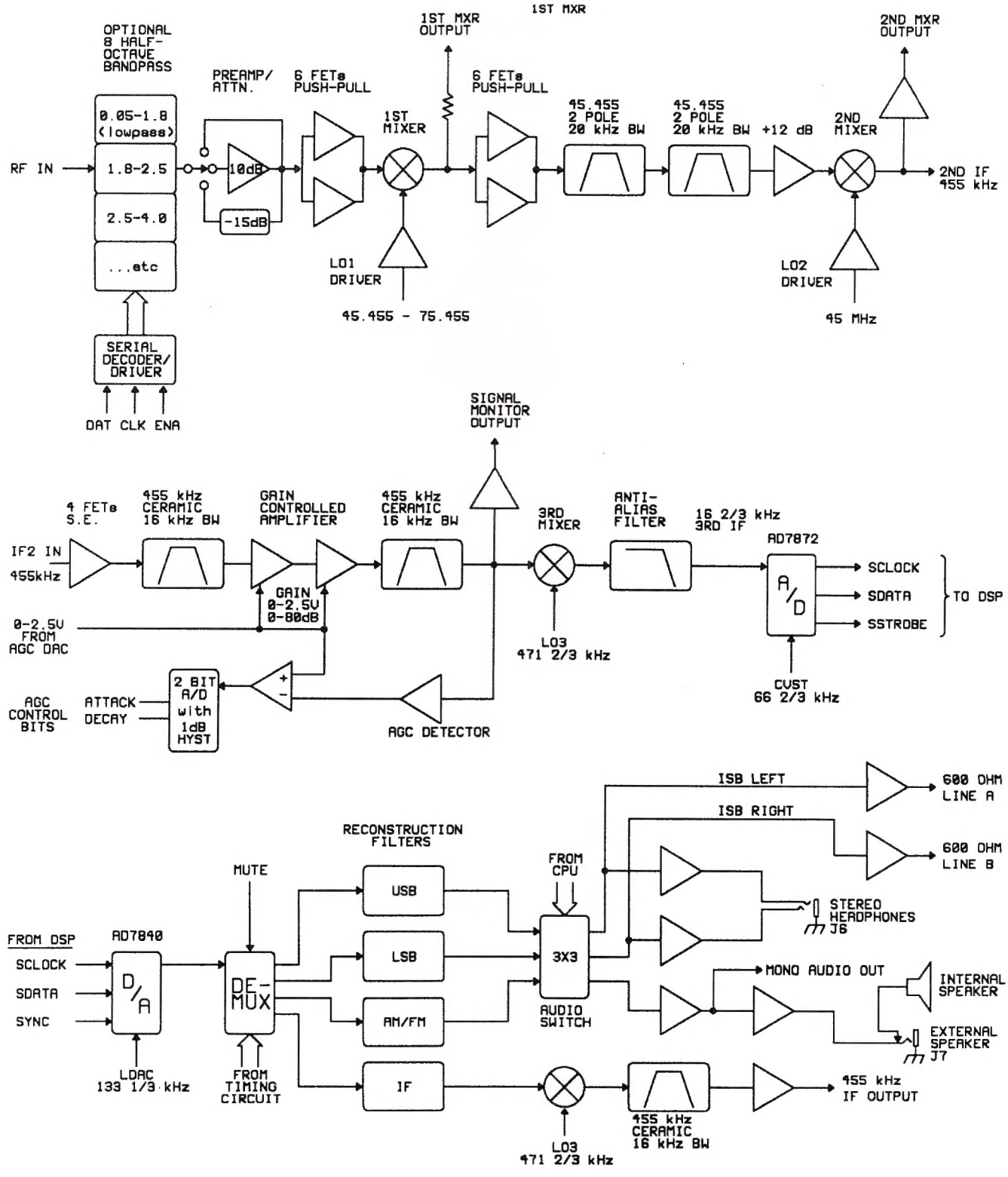

FIGURE 10-1

Part No. 74262
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"A Review of Amateur Service Regulations"

-the ACA Discussion Paper Discussed.
by Bob Harper VK4KNH

The Radio Regulations define the Amateur Service as..."A radiocommunications service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest."

The ACA "A Review of Amateur Service Regulations" is a significant document in the history of Amateur Radio in Australia, and it follows somewhat significant changes in the ITU regulations that came out of WRC-03.

Every licenced Amateur should have received by now, a letter from the ACA, dated 20th August 2003, referring to the discussion document, and requesting your input by the 31st October 2003. The full paper is available as a PDF file from the ACA website - www.aca.gov.au.

At risk of beginning at the end, the paper appendix lists some rather sad statistics which, if not addressed, could result in major losses in band space for amateurs.

The ACA database shows a gradually declining Amateur population, from 17,036 in in June 1996, peaking to an all time high of 17,158 in September 1996, and falling from then to 14,364 in the most recent figures of June 2003. That's less than one Amateur per thousand citizens. See the graph on this page.

Note also that by subtracting the beacon and repeater licences, not to mention multiple licenced operators, there are fewer than 14,000!

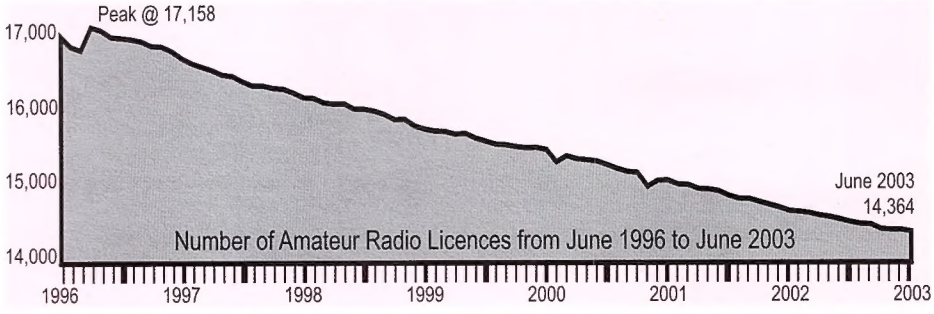
Rather than print the discussion paper -which would take up a large proportion of this issue, I'll review the information for you, adding my thoughts as I go. Please do take the time to read the full document, either a friend's copy, off the internet or from your local club. Details for downloading at the end of this article.

Before I Begin...

The ACA seemed to reduce the 10WPM to 5WPM quite rapidly in 2000 and this was well appreciated I am sure. However to now argue that it will take 12 months to finalise the situation seems very slow when the UK and Swiss authorities have reportedly already acted. Without the Morse Code, there are automatically two classes of licence, the inappropriately named "Unrestricted Licence" and the just as innappropriately named "Novice Licence".

Document Summary

At the beginning of the document the ACA point out that the Amateur Service is primarily for "Hobby Radio-Communications" and for "Technical Experimentation". The ACA note that there were fewer than 14,400 licences in June 2003.



As Amateur Radio does indeed span the globe, the international arrangements are controlled by the ITU (International Telecommunications Union) particularly under article 25 which was revised in WRC-03.

This is the first substantial change in Article 25 since 1925, and as such, there is a lot to be considered. The ACA listed some possible changes to the Amateur Radio service including the possible removal of Morse Code requirement from below 30MHz.

NOTE:- this does NOT mean denying you the pleasure of using CW. You will still be able to communicate on CW but new amateurs will not be required to sit a CW test to get on air.

Other changes which would naturally follow would be the amalgamation of licence classes where removal of CW also removes any differences between those classes. eg a limited, intermediate and unlimited licence would be the same qualification.

The final considerations relate to Examinations, Certificates of Proficiency and Callsign Allocation, and the possible introduction of a foundation licence.

Article 25 has been changed in the past, mostly rewording of clauses to remove inconsistencies and to clarify meaning, however the main changes have been related to the use of Morse Code on the bands. In 1948 Article 25 was changed to only require Morse Code below 1000MHz, that was lowered to 100MHz in 1959 and to 30MHz in 1979.

(At that rate it should have disappeared ages ago! -ed)

An interesting clause states that "The proposed regulatory arrangements aim to improve the efficiency and effectiveness of amateur regulation, make licensing arrangements simpler for clients and reduce the burden of regulation on the community."

The ACA expects to announce the changes in early 2004 but may take twelve months to finalise the introduction of these changes as regulatory arrangements pass through government.

Outline of Regulatory Arrangements

There are three forms of licence recognised under the Radiocommunications Act, Apparatus Licence, Class Licence, and Spectrum Licence

Apparatus Licence

An apparatus licence allows a licenced operator to use the appropriate equipment on the allocated bands or frequencies for a renewable licence fee.

At present - the operation of an Amateur Station must be authorised by an apparatus licence. Anybody may listen without qualification, but to transmit, operator qualifications and a station licence issued by the ACA are required. Amateurs may build their own equipment but the equipment must comply with generally established specifications.

Class Licences

Class licences are open to all users, do not have to be applied for, require no licence fee, but can require type approved equipment. CB radio is a class licence, meaning all amateurs are already licenced to use the CB bands under the class licence -using type approved equipment.

Spectrum Licences

Spectrum licences are tradable, technology neutral, issued to cover a spectrum space regardless of technology, system or service, for a fixed non-renewable term.

Minimum Qualification Required	Licensing Option (Current)				
	Unrestricted	Intermediate	Limited	Novice	Novice Limited
AOCP/HAREC(A)	YES				
AOLCP/HAREC(B)		YES	YES		
NAOCP		YES		YES	
NLAOCP					YES

LCDs

Amateurs operate under the "Radiocommunications Licence Conditions (Apparatus Licence) Determination 2003" and the "Radiocommunications Licence Conditions (Amateur Licence) Determination #1 of 1997".

Qualifications

In order to become an Amateur Radio Operator, a person must gain a Certificate of Proficiency as required by the ACA and set out in the "Radiocommunications (Qualified Operators) Determination #1 of 1993".

All of these documents can be downloaded from the ACA web-site.

The AOCP qualification is aligned with the "Harmonised Amateur Radio Examination Certificate" (HAREC) which is important in allowing operators to receive recognition when overseas and allow overseas operators to operate within Australia.

HAREC has two levels, both referring to AOCP Theory but with one requiring Morse Code proficiency. There is apparently no Novice HAREC.

Examinations

In Australia the WIA is authorised to carry out testing on behalf of the ACA, and examinations are held at arranged dates according to the plans of those operating the examinations. In the past the examinations were held four times a year at nominated locations, supervised by the then DOC/DOTC/PMG etc.

Overseas Arrangements

Without going into great depth there are a few comments that are perhaps worth mentioning. Canadian Amateurs before 2000 needed to be licenced themselves as well as having a licenced station.

The Operators Certificate was issued for life but the Station Licence needed to be updated and paid for annually. The Basic Qualification allowed the operator to build anything except a transmitter which required an Advanced Qualification.

Post April 2000 the Operators Certificate, and the Station Licence were combined and now Amateurs need only advise of any change of address.

The USA have three licence categories, Technician General and Amateur Extra, plus three other classes remaining after previous changes.

The UK have three levels Full, Intermediate, and Foundation. Following the WRC-03, the UK combined the A & B classes of the Full and Intermediate licences effectively removing all Morse Code requirements immediately.

The UK Foundation licence is essentially a stepping stone to the Intermediate level. As were Novices who were supposed to be in the process of stepping up to "Full call"! I do not believe in terms like foundation or novice unless there is a real expectation that it is temporary.

I have been licenced long enough to join the Old Timers Club, yet some who were licenced at the same time are still Novices!

ITU Article 25

I will not go over the individual changes to the eleven clauses as in the discussion paper. Instead I'll jump to the next section (5.0) where the ACA discuss the impact of the changes to Australia and Australian Amateurs, which I think is better reading. Unless mentioned here, there are no proposed changes in Australia.

NOTE:- The following are proposals and/or discussion of possible changes. Do not change your operating practices unless advised by the ACA of actual changes.

Third Party Communications

Third Party messages may be passed from one station to another at present under arrangements with the USA, Canada, Israel, Honduras and Soloman Islands.

However under the changes to Article 25 third party messages will be permitted in times of emergency or disaster, as determined by the administration concerned. It's a bit wishy washy, but previously the clear word was "NO!" The ACA proposes to maintain subsections 5(1) and 5(2) and amend 5(4) of the Amateur LCD, to remove the prohibition of third party communications.

Morse Code Below 30MHz

The ITU have removed any requirement for Morse Code so that the ACA is now clearly able to remove Morse Code as a requirement without offending other ITU nations. The ACA proposes to discontinue Morse Code requirement in the bands below 30MHz (ie remove Morse Code requirement entirely.) to combine AOCP and AOLCP grades, and combine NAOCP and NLAOCP grades.

The ACA seek comment and suggestions about "how early removal of the Morse Code requirement could be implemented without causing inefficiencies in the implimentation of new regulatory arrangements."

How about right now? It is difficult to understand why this matter should have such world-wide rammifications. If Australians travelling overseas need proof of their Morse Code proficiency then perhaps they should take their Certificate of Proficiency with them?

As for OS hams coming here, we can accept them with or without CW -is that too simple? Apparently it was not a problem for the UK and some other European countries.

Operating Parameters

The ACA recognise that in combining the classes, some amateurs will be allowed higher output levels. Somehow there seems to be a reservation that the "upgraded classes" might not be sufficiently proficient, even though the technical capability of the combined amateur classes had already been established, tested at the same level, by the same examination. I hope I am misreading something there.

The ACA propose to maintain their current standards on the purity and stability of the signal, and I trust that all the previously "Limited" operators will make sure that their HF emissions are within tolerance as well!

Callsigns

There is no change in Article 25 as to the use or allocation of callsigns, however another article -19, allows for four letter callsigns. The ACA has no proposals for change at this point but seek comment on whether the structure be simplified to so that any licence could be transferred to other states with the call-holder, and so the callsign would remain with the call-holder as higher classes are gained. See further comments later in this article.

Disaster Comms

ACA proposes no changes resulting from Article 25 as Australians already have four options in time of a disaster:-

- operation as normal under the Amateur LCD;
- operation in amateur bands but with higher power as authorised by a special condition on the amateur licence;
- operation outside the amateur bands authorised by a Scientific Licence; or

Latest Up-date - Switzerland, UK, Belgium and Germany have dropped CW requirement.

Current Class	Current Callsign
Unrestricted	VK$aa, VK$Aaa, VK$Baa, VK$Caa, VK$Daa, VK$Eaa, VK$Faa, VK$Gaa, VK$Iaa, VK$Saa, VK$Waa, VI$aa, VI$aaa, AX$aa, AX$aaa, VK$RAN, VK$TTY, VK2RAS, VK$WIA-WIZ (WIA), VK$GGZ-GGZ (Guides Aust), VK$SAA-SDZ (Scouts Assoc.), VK7OTC, VK$IYA - IYZ (International years)
Intermediate	VK$Jaa, VK$Kaa, VI$aa, VI$aaa, AX$aa, AX$aaa
Limited	VK$Taa, VK$Uaa, VK$Xaa, VK$Yaa, VK$Zaa, VI$aa, VI$aaa, AX$aa, AX$aaa
Novice	VK$Laa, VK$Maa, VK$Naa, VK$Paa, VK$Vaa, VI$aa, VI$aaa, AX$aa, AX$aaa
Novice Limited	VK$Haa, VI$aa, VI$aaa, AX$aa, AX$aaa
Repeater	VK$Raa, VK$TTY
Beacon	VK$RSa, VK$RTa

Combined Classes	(Possible) Structured Class Callsigns	(Possible) Rationalised Callsigns
Amateur Operator (or other names as chosen)	VK$aa, VK$Aaa, VK$Baa, VK$Caa, VK$Daa, VK$Eaa, VK$Faa, VK$Gaa, VK$Iaa, VK$Jaa, VK$Kaa, VK$Saa, VK$Taa, VK$Uaa, VK$Waa, VK$Xaa, VK$Yaa, VK$Zaa, VI$aa, VI$aaa, AX$aa, AX$aaa, VK$RAN, VK$TTY, VK2RAS, VK$WIA-WIZ (WIA), VK$GGZ-GGZ (Guides Aust), VK$SAA-SDZ (Scouts Assoc.), VK7OTC, VK$IYA - IYZ (International years)	VK$aa, VK$Aaa, VK$Baa, VK$Caa, VK$Daa, VK$Eaa, VK$Faa, VK$Gaa, VK$Haa, VK$Iaa, VK$Jaa, VK$Kaa, VK$Laa, VK$Maa, VK$Naa, VK$Paa, VK$Saa, VK$Taa, VK$Uaa, VK$Waa, VK$Xaa, VK$Yaa, VK$Zaa, VI$aa, VI$aaa, AX$aa, AX$aaa, VK$RAN, VK$TTY, VK2RAS, VK$WIA-WIZ (WIA), VK$GGZ-GGZ (Guides Aust), VK$SAA-SDZ (Scouts Assoc.), VK7OTC, VK$IYA - IYZ (International years)
Amateur Communicator	VK$Haa, VK$Laa, VK$Maa, VK$Naa, VK$Paa, VK$Vaa, VI$aa, VI$aaa, AX$aa, AX$aaa	
Amateur Limited (Entry)	VK$Oaa, (VK$Oaaa ?)	
Repeater	VK$Raa, VK$TTY	VK$Raa, VK$TTY
Beacon	VK$RSa, VK$RTa	VK$RSa, VK$RTa

• operation using a third party authorisation with, for example, fire, police or emergency services.

Some might suggest that Australians, in time of emergency, have a knack of finding solutions.

Overseas (Visiting) Operators

Although the changes in Article 25.9B are mainly to simplify the language in the clause, the CEPT Recommendation T/R 61-01 appears to require Australia to create a class licence to accept overseas operators under Australian legislation. This topic comes up again further into the discussion.

Options for the Future

Section 6 of the Discussion paper is perhaps the most interesting to us, and will hopefully be the most fruitful.

The ACA determine that the matters that need to be considered are the licensing structure, licensing regime (apparatus or class) and the possible outsourcing of management of amateur examinations, certificates, callsigns, and station location.

The repeater and beacon licences could remain the same, as there is no apparent reason to change them, except that callsigns could be rationalised.

The removal of Morse Code from the examination process leaves the current five licences fitting neatly into two classes -AOCP and NAOCP. This would be the cleanest, quickest way to proceed, which would cause the least confusion and anxiety.

My input is that the previously named "Unrestricted Licence" simply be called the "Amateur Operator Licence" and that the certificate remain as the "AOCP". The Novice Licence must be renamed, perhaps to the "Amateur Communicator Licence" (ACL) and the certificate be the "Amateur Communicator Certificate of Proficiency" (ACCP) but be equivalent in syllabus content to the NAOCP.

Of course all examinations and syllabii should reviewed from time to time to stay in step with technology and practice.

The proposed "Foundation" class

-If that is the name chosen, I believe we will live to regret it, just as the term "Novice" soon lost it's novelty. Indeed many names for such a licence soon taint and we should be very, very careful in our name selection. The WIA proposed the "Foundation Licence" along the lines of the UK licence, where I am told a 6 year old is now licenced.

Might I suggest that the CBRS is a better introduction to radio than a day spent in classes.

I propose that this licence should be called the "Limited Radio Licence", where the word "limited" is much more appropriately used than it was in describing a person with full AOCP theory. I also suggest that no Certificate of proficiency be issued but rather that a person complete an application and sign an agreement to abide to a set of regulations. A callsign would be issued for a fixed period of perhaps as long as five years but preferable for two years or as little as 12 months. A callsign not within the current structure would be issued for that limited period.

As for power and bandspace, the Limited Radio Operator (LRO) should be limited to 20 Watts SSB on HF with a 100kHz slot on each of 80/15/10m and 10Watts FM on 70cm (essentially handheld). This should provide an introduction without overwhelming the existing users! A provision to encourage operations as second operator would allow the LRO to experience greater power, modes, frequencies and range while supervised by a higher licensed operator.

In fact the path to the next level could include a verified number of hours as second operator, and another number of hours as sole operator with log book support to encourage good log-keeping.

If a class licence structure is used then the person could pay a single administration fee for the issuing of the licence and callsign. Where the licensing is delegated to an external authority such as the WIA, the fee might even be waived or incorperated into the membership fee.

How to Licence

It is obvious that the ACA want to consider a class licence for Amateur Radio, and there are advantages to both Amateurs and the ACA in going this way. The ACA hope to achieve administrative and efficiency gains through class licencing. Amateurs might expect lower annual fees or even no annual fees, perhaps merely administration charges for occasional transactions such as issuing a licence and callsign. I suspect that the cost of recovering the annual licence fee from such a large and diverse population is very likely more trouble than it is worth.

A change to a class licence structure does not require a change in the licence qualifications, or entitlements. The main reservation with class licences is that the ACA needs to know who we are and where we operate from to assist them in interference investigations. The ACA database must be kept up to date and I personally think that this would be the most difficult aspect of maintaining such a large population of licencees. Just one year at producing the WIA callbook taught me how complex the database had to be, and how lax some of us are at advising the ACA of our address changes. A survey I read recently said that 42% of Australians changed address in a five year period. Did you? Did you notify?

I doubt that amateurs receive the same government support that other sports and hobbies do, but I understand that the government has to administer Amateur Radio not just within Australia but representitively overseas as well.

Callsigns

It seems that at WRC-03, ITU Article 19 was also altered to allow callsigns with four letters after the digit, so we could have a VK9ABCD callsign as well as VK9ABC or VK9AB. I would like to see the four letter callsigns reserved for the LRO I mentioned above, to avoid confusion with current callsign structures.

I understand that some might see that having a "different" callsign could be an advantage but I am sure that an involvement in contests or DXpeditions would encourage a person to seek the shortest callsign possible. The ACA see no reason to continue with the callsign "structure" as it applies to Novice/Novice-Limited/Limited/Intermediate etc but strangely seem to think that the two letter callsigns should remain the property of the highest level licence. I could follow their argument if it were consistant.

The other suggestion from the discussion paper would randomly allocate the digit 0-9 regardless of state. I see no reason to change the present arrangement except to agree that where a person relocates to another state they should be permitted to retain their original callsign or to seek another local callsign as they prefer. To open it up to all would promote a raid on (for example) Tasmanian two letter calls by the remainder of Australian "full call" amateurs.

Finally on callsigns there is a suggestion that "the reservation of two-letter callsigns (VK#aa) for Unrestricted amateurs could remain."

This is simply wrong as under a "No-Morse Code" situation there is no legally defendable position for such discrimination. All AOCP classes are the same. The two-letter callsigns stand to divide the Amateur Radio community if the handling and allocation of them is in any way discriminatory.

Outsourcing Examinations

The ACA agree that "There is no reason for the ACA to manage the amateur examinations, certificates, callsigns or, if class licensing proceeds, station location information. The WIA have an agreement that is in place until January 2005. The ACA could at that time decide to continue with the WIA, seek another provider, or return to doing their own exams.

I agree with outsourcing the exams especially when removing the Morse Code tests greatly simplifies the examination procedure. Any primary school could be used as an examination venue, supervised by a resident teacher. The examination marker doesn't have to know anything about radio as the answers are already chosen.

With suitable supervision to verify the identity of the contender, the examination can be held at any time on the internet and the result provided immediately upon completion. TAFE have used such programs for over ten years.

The Database

Each Radio Operator must maintain a station location address with the ACA in order to facilitate interference investigations. There is an obligation on the operators part to provide the true address. Currently the station address changes are forwarded by mail and signed as an affirmation of the details.

Radio operators could just as easily log into a web page and change their details directly into the ACA database and verify with their Certificate of Proficiency number. Most programmers would update via an update record to avoid irreversible changes to the main database.

The database would be the best source of examination results, certificates, callsigns, and licensee details.

Reciprocal Licensing

Australia has arrangements with several countries as well as CEPT. Australia spends money on making these agreements where it seems logical to me for countries to agree on a standard, comply with that standard and accept qualifications from other countries who are signatories to the standard. Perhaps based on the CEPT model. The CEPT model however is Class Licence based and it seems that this is another reason to propose class licensing in Australia.

Interference

The Document reminds us how much more electronic equipment is about today and raises the question of interference. The way the document reads, you would think the amateur sets out to cause interference. Certainly I think a lot of amateurs will read page 35 and think they're being accused of causing the interference. Read it again, carefully, and you'll see that the ACA do mention that "radio and television receivers vary in quality and many do not have a high level of immunity to interference." Now I think you'll agree that is a fairly accurate statement. Even when the bands are dead and all the little hams are snuggled up in bed, a modern TV can find interference.

So the ACA propose a non-interference policy! I would like to think that would prevent the power authority from transmitting up past the 80m band, and next door's blender from frying my speakers during the Sunday morning broadcast, but guess what, it's aimed at our no doubt clean signal that's putting annoying herringbone patterns on the $199 Colour bedside TV that next door bought in Hong Kong!

I hope all of you clearly express your opinions on this proposal.

I have to quote this line from the paper: "The operation of an amateur station, which is essentially a hobby, should not disturb another person's activities, such as television viewing or radio listening, or affect commercial acivities." What would you describe the householders TV watching activity as -a profession!

It may be time to point out that operating a radio is a hobby for some, a sport for others, leisure for a few more, excitement, entertainment, strategy game, family communication, etc etc. The bottom line is that the Amateur (or CB) radio may be a greater part of the life of the operator than a mere hobby. It might cost well in excess of the price of the piece of junk that can't tell the difference between 28MHz and Ch0.

I would hope that the ACA would begin by confirming that the transmitting station operating correctly, before going through any of the proposed cures

listed on page 35. "moving the location of their transmitter, coming to a mutually agreed arrangement with the complainant regarding the costs associated with fitting a filter to the domestic television of radio, reducing the power output of the transmitter, or restricting their hours of operation to outside peak viewing times for television reception." -that's without mentioning that their consumer equipment is crap. I think the ACA really wants you to comment on this one!

The remaining two policies effect few of us, bring on the Amateur Radio Satellite Networks fee reduced from $13,200 to $6,600 and AILS about the clarity of their fact sheet.

My Summary

• ***Morse Code is dead, Long live Morse Code!*** —by that I mean that Morse Code is no longer an ITU requirement to become licensed on HF —but you can still use CW, and I hope I will always be able to tune into some CW even if I don't stop to read what is being said.

• The ACA should immediately acknowledge (ASAP) that anybody who passed their Regulations and AOCP Theory has indeed qualified to AOCP level.

• Likewise, anybody who has passed Regulations and NAOCP Theory is NAOCP qualified. This should not require legislation, just the same common sense which other countries have shown.

• The name Novice, when applied to a person who passed a Novice licence almost 30 years ago, is ridiculous. How about "Amateur Communicator".

• Any new licence class aimed at encouraging new amateurs should be easy entry, short term limited, low power, narrow band slot, perhaps called "Limited Radio Operator" or "Amateur Limited".

• Examination changes should follow a standardised syllabus which would hopefully be based on what an Amateur Operator needs, not on a shopping list.

• As far as possible licensing should be based on experience gained not facts learned. Contenders could sign an agreement to abide by the regulations rather than sit a 30 Question test, which we all recognise can only sample one's knowledge.

• On the basis that experience if far more valuable than book learning, and in light of current Competency Based Standards, and Problematic Learning regimes, a mentor scheme should be investigated as a possible way to reduce examination management.

eg a "Entry Level" could require a person to achieve certain operational goals under supervision of a licenced Amateur before a class licence is issued.

"Amateur Communicator" level could then require an entry level person to continue to log contacts, achieve goals, and prove capability in a specially printed logbook, which would then be assessed by two or more licenced Amateurs before a certificate/licence application is signed by those assessors. Again a class licence would be appropriate, assuming that some restrictions were placed on transmitter construction.

Amateur Operators, who would be licenced to construct equipment, and access others, and perhaps assess the constructed transmitters of others, should continue to be licenced by Apparatus Licence as I understand the distinction.

• Interference can be a result of consumer greed as well as transmitter fault. "Cure the cause" not "cause the cure".

I understand that a person can make a complaint and under the "user pays" doctrine, pays a fee for the investigation. If the investigation finds no fault the fee is lost, which seems fair. If a fault is found the fee is refunded but the amateur (or other operator) is required to rectify the problem -by ceasing transmission if necessary.

This assumes that energy transmitted by a station causes the interference, and amateurs could find a neighbour with a very expensive plasma "Drive-in" screen which objects to his/her clean HF transmitter. The plasma screen will most likely create noise on the HF radio as well but that's apparently not an issue.

As the amateur facing an expensive repair and/or modification to the neighbours equipment, what can you do? Well the fear that I have is that your only course of action will be to sell the HF set and take up watching your neighbours TV from your own back yard, or move to a less populated neighbourhood.

Consumer electronics does emit RF. Consumer electronics does suffer from front end overload, or circuit reception. A clean transmitter and station is the best, but not necessarily sufficient, defence.

Although it has been a long established SOP to cease transmissions until the problem is resolved, Amateurs must feel confident the ACA accepts that the interference may be attributable to the complainants equipment.

What should you do?

• Encourage your neighbours to inform you of any signs of interference rather than spend the money to place a complaint.

• Suggest possible ways to cure the problem and even offer to supply a filter if that's appropriate. Don't get into pulling their TV apart or you may wear the cost of a new TV.

• Offer to have an independant person look into it, a TV rapair man, radio engineer who happens to be a club member, etc. Once again don't change anything without their explicite and expressed permission. -then record everything that was done.

• Don't get into an argument over it! If the situation heats up offer the number of the ACA complaints line and leave them to think it over. Try to stay external to any argument and understand their frustration before your own!

What is not but perhaps should be in the Document ?

Towers

The ACA are not responsible for towers, and they shouldn't be. That's an engineering and environment consideration. However, federal support could be given to amateurs and other radio licencees, for home towers, of a suitably limited height, providing they are properly engineered, safely constructed and placed, are tidy and well maintained.

This support recognises the value of amateur radio in emergency and disaster situations, as a community resource. If the US is supporting Amateur Radio Operators as a valuable community resource, Australia should do so as well.

Public Heritage Spectrum

Maybe we should be looking at another option; for Australia to show to the world. Establish a recognition of "Public Heritage Spectrum", recognising non-commercial users of the bands as being private citizens, and allowing access and use of the bands in the "Frequency Domain" just as Australians share National Parks in the "Terra Firma" domain.

Retain a minimum 5% of all spectrum, balanced across the whole spectrum, for all to share, for ever more. It would be a class licenced spectrum allocation, with bands continuing to be allocated on a use basis.

Allow the public the same rights to their radio spectrum that governments worldwide have recognised for land usage. This would not be for Amateurs alone but would combine all private usage such as hobbies and sports, as well as keeping some naturally clean space for Radio Astronomy and other passive experimentation.

We must save some airspace from commercial pressure if for no other reason than it belongs to all of us, not just the commercial interests. Scientists can't study natural phenomena if there's none left!

Currently almost every consumer item uses a computer, operating at RF frequencies, or uses another RF technology to replace the work previously done by our fingers or legs! There is a real threat that recreational bandspace will disappear to the consumer/commercial interests.

If Greenies can save the forests, maybe some of us should stand up to save the spectrum as well!

Please get a copy of the document, read it, and send in your thought out and constructed argument to the ACA.

APPENDIX A
International Telecommunication Union - Radio Regulations
(prior to WRC-03)
ARTICLE 25
Amateur services

Section I - Amateur service

25.1 § 1 Radiocommunications between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunications.

25.2 § 2 1) When transmissions between amateur stations of different countries are permitted, they shall be made in plain language and shall be limited to messages of a technical nature relating to tests and to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified.

25.3 2) It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.

25.4 3) The preceding provisions may be modified by special arrangements between the administrations of the countries concerned.

25.5 § 3 1) Any person seeking a licence to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear, texts in Morse code signals. The administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz.

25.6 2) Administrations shall take such measures as they judge necessary to verify the operational and technical qualifications of any person wishing to operate the apparatus of an amateur station.

25.7 § 4 The maximum power of amateur stations shall be fixed by the administrations concerned, having regard to the technical qualifications of the operators and to the conditions under which these stations are to operate.

25.8 § 5 1) All the general rules of the Constitution, the Convention and of these Regulations shall apply to amateur stations. In particular, the emitted frequency shall be as stable and as free from spurious emissions as the state of technical development for such stations permits.

25.9 2) During the course of their transmissions, amateur stations shall transmit their call sign at short intervals.

Section II - Amateur-satellite service

25.10 § 6 The provisions of Section I of this Article shall apply equally, as appropriate, to the amateur-satellite service.

25.11 § 7 Space stations in the amateur-satellite service operating in bands shared with other services shall be fitted with appropriate devices for controlling emissions in the event that harmful interference is reported in accordance with the procedure laid down in Article 15. Administrations authorizing such space stations shall inform the Bureau and shall ensure that sufficient earth command stations are established before launch to guarantee that any harmful interference which might be reported can be terminated by the authorizing administration (see No. 22.1).

APPENDIX B
International Telecommunication Union - Radio Regulations
(after WRC-03)
ARTICLE 25
Amateur services

Section I - Amateur service

25.1 § 1 Radiocommunication between amateur stations of different countries shall be permitted unless the administration of one of the countries concerned has notified that it objects to such radiocommunications.

25.2 § 2 1) Transmissions between amateur stations of different countries shall be limited to communications incidental to the purposes of the amateur service, as defined in No. 1.56 and to remarks of a personal character.

25.2A 1bis) Transmissions between amateur stations of different countries shall not be encoded for the purpose of obscuring their meaning, except for control signals exchanged between earth command stations and space stations in the amateur-satellite service.

25.3 2) Amateur stations may be used for transmitting international communications on behalf of third parties only in case of emergencies or disaster relief.

An administration may determine the applicability of this provision to amateur stations under its jurisdiction.

25.5 § 3 1) Administrations shall determine whether or not a person seeking a licence to operate an amateur station shall demonstrate the ability to send and receive texts in Morse code signals.

25.6 2) Administrations shall verify the operational and technical qualifications of any person wishing to operate an amateur station. Guidance for standards of competence may be found in the most recent version of Recommendation ITU-R M.1544.

25.7 § 4 The maximum power of amateur stations shall be fixed by the administrations concerned.

25.8 § 5 1) All pertinent Articles and provisions of the Constitution, the Convention and of these Regulations shall apply to amateur stations.

25.9 2) During the course of their transmissions, amateur stations shall transmit their call sign at short intervals.

25.9A Administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief.

25.9B An administration may determine whether or not to permit a person who has been granted a licence to operate an amateur station by another administration to operate an amateur station while that person is temporarily in its territory, subject to such conditions or restrictions it may impose.

Section II - Amateur-satellite service

25.10 § 6 The provisions of Section I of this Article shall apply equally, as appropriate, to the amateur-satellite service.

25.11 § 7 Administrations authorizing space stations in the amateur-satellite service shall ensure that sufficient earth command stations are established before launch to ensure that any harmful interference caused by emissions from a station in the amateur-satellite service can be terminated immediately (see No. 22.1).

Written submissions to be received by the 31st October 2003 should be sent to the ACA by Fax on (02) 6219 5133, email to amateur@aca.gov.au or post to:-
Manager
Space and Terrestial Systems Team
Radiofrequency Planning Group
Australian Communications Authority
PO Box 78
BELCONNEN ACT 2616

Any questions should be sent to the same fax/email/address or phone (02) 6219 5578

moffat's madhouse

TIME OUT!

- by Tom Moffat
madhouse@esr-mag.com

Ever wonder why this column is called "Madhouse"? Well, today we're going to stretch the mind right up to the breaking point. Certain things have been happening to me, and other people as well, and I want answers about what's causing them. Perhaps some reader has the answers? Maybe we can get together and share the Nobel Prize.

The most recent incident occurred last week on the day of my daughter's birthday. I have an ancient Hewlett Packard handheld computer, the ancestor of today's Palm Pilots. As part of its built-in software, this computer has an appointment calendar which can be set to beep at a specified time. It is the ideal anti-birthday-forgetting feature.

So on the morning in question, I was awakened by the little computer going beep-beep, beep-beep, beep-beep, and it sounded like it was some distance away. but as I reached for the light, the beeping stopped, and the little computer was sitting in its usual place on my bedside table.

I opened the lid to see what message was displayed on the screen, but there was nothing. So I rolled over and went back to sleep.

A few minutes later, the computer went off again, this time with its usual powerful beep-beeps. And when I opened the screen, there was a message, "Jenny's birthday". But where did that earlier alarm come from? The sound was very distinctive; pairs of beeps. For a moment I thought "bird", and we do have some fine avian mimics around here.

One can even copy a telephone ringing, and it seems to take great delight making people rush indoors to answer a non-existent phone call. But it's unlikely a bird could have heard the computer beep because it only alarms a few times a year. And how would a bird know to make the sound, just a few minutes before the real thing?

This whole business gets into the realm of precognition - experiencing things before they happen. A similar effect is waking up just before the alarm clock goes off.

Many people, including me, experience it regularly. There are numerous accounts of this on the internet, and a popular explanation is that an alarm clock makes a small click as a ratchet falls into place just before the sound occurs. But this only applies to mechanical alarm clocks. What about electronic clocks? Or clock radios?

We should look more closely at precognition. According to our old friend Dr. Albert Einstein in his Theory of Relativity, there is a structure called the Space-Time Continuum, which defines the entire physical universe.

The continuum consists of four dimensions. The first three are actual positions: up-down, left-right, and in-out. We can move about quite freely with our current location clearly defined. But in time, you can only go one way: forward.

Well, maybe.

The English language has good ways to express these concepts. "Here" is where you are at the moment. "There" is where everything else is. As for time, "Now" is where you are at the moment, "Then" is where you were previously, and "When" is where you will be after some more time passes.

For instance, "I'll visit WHEN I have enough money for the ticket." (A definition of some future event.) "I'm HERE and she is over THERE". And if you want to emphasize your situation, you say "That's what it is, HERE and NOW!" This neatly wraps up all four dimensions in one small sentence. In conventional thinking, "Now" is somewhat redundant since you are always in Now. "Time Passes" suggests that time is moving forward and you are standing still.

Imagine you are on a beach, facing into the wind. Even though you are stationary, you feel a sensation of movement on your face. If you walk forward, air (time) passes at a greater rate. If you walk backward, air (time) passes more slowly.

So what if we could actually fudge "Now" slightly, slowly walk backward or forward along the beach is the wind remains constant?

If I had somehow slipped backward through time, just a tiny amount on the overall scheme of things, then I wouldn't have been exactly at the correct Now place when the computer beeped.

So I would have heard it, weaker than normal because of the distance through time. When I arrived a few minutes later at the correct Now place, I would have experienced the computer's performance correctly instead of as a weak phantom.

So what's going on here, folks? Are we changing the speed of time? Well, many years ago someone flew an atomic clock around the world in a commercial airliner, and during that journey the atomic clock gained a significant amount of time.

It's Einstein's link between space and time. More of one, less of the other, everything in balance.

It's interesting to note that most of these events we've been talking about occur during sleep. We know that metabolism slows during sleep. Perhaps time changes too somehow.

Maybe that's why people age - they eventually run out of time. If we didn't sleep, would we live forever?

Now let's move on to a similar, related effect, that occurs during full wakefulness. Consider the phenomenon known as "deja vu", the sense or illusion of having previously experienced something actually being encountered for the first time.

We have all experienced this. Think about it. Could deja vu be some ill-defined and totally accidental form of time travel, maybe just in the mind?

I discovered a similar and much more powerful effect while travelling around the USA. One of my stops was Denver, Colorado, where I'd spent some time attending technical school back in the 1960's. I decided to try to find the school thirty years on, without success. But what I did find was the Olin Hotel where all the students stayed.

I walked along the footpath to this place and paused at the doorway. And then I was hit, literally, with a blast from the past.

All these images of life at the Olin came back with such clarity that it felt like it was all happening again. I could see the faces of people I knew, I could name names I'd forgotten so long ago. The Olin was a good place, it had "good vibes", so those flashbacks were a most pleasant experience. And it was all so real!

What I think happened here was that no images actually came out of the Olin Hotel. They were stored in some long-forgotten video recorder in my brain, and looking into the doorway of the Olin simply hit the play button. The tape hadn't been replayed for years, but its images were just as good and clear and colourful as the day they were recorded.

Now... I know very well that the things in those images actually happened, and I HAD been there thirty years before. But what about the case when the video in your mind starts replaying memories, triggered by the sight of something, but you KNOW you've never been there before. How was it recorded? When? Maybe it wasn't really recorded at all, but you just slipped back in time to experience the memories live.

ACCIDENTAL TIME TRAVEL?

The more I think about this, the more I think it could be an effect of Einstein's Space-Time Continuum. That is, if you want to re-live some important event in your past, your experience is much more vivid if you can physically visit the place where the experience took place. That way you can neutralize the space (distance) component completely and the only dimension keeping you from your target is the time difference - from THEN to NOW.

A similar event surrounds the much-underrated scientist Nikola Tesla, inventor of such things as wireless power transmission and alternating current. Tesla's wireless power experiments were based in Colorado Springs, about 100k down the road from Denver.

I was working on an article on Tesla, and thought it might be interesting to visit the actual site of his transmitting apparatus, located within what is now a city park. I had hoped to find foundations of his building, or something, but there was only a small plaque near the road, distant from the actual site, commemorating Tesla.

Still, given hints from books about Tesla and help from a local Tesla museum, we nailed down the spot eventually.

Again, there was that feeling of being so familiar with what was by then no more than a patch of grass. Obviously I had never been there before since Tesla's experiments took place more than 100 years ago. Same thing again I guess - eliminate the distance and become closer in time.

These things might explain why it is such a comfortable feeling to visit an old family home or some other much loved place from your past.

You can look at photos over and over, but nothing beats the real thing. The people involved in these places might be long gone, the house having several new owners since you moved away. But all that seems immaterial when you've reduced the distance to zero and the memories replay just as if they happened yesterday.

It's true we've treated Einstein's Space-Time Continuum in a rather rubbery fashion, bending it here and stretching it there.

How is it related to false alarms within computers and beating the alarm clocks and sliding down the wire of time to visit places of your youth? Perhaps some clever PhD student might make this the subject of his thesis and explain once and for all these goofy time-related things that affect so many of us. Don't forget that Nobel Prize!

Tom mentioned feeling the wind blowing in his face at the beach -perhaps the precognition of the alarm was another event passing through time, brushing by, just tantalising his senses -just enough to beg the question, not enough to supply an answer! -ed

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CB-radio secrets

Project Cybernet - CB Radio Modifications for the Radio Amateur et al. Part 2 - Block Diagram Guided Tour

by Bob Harper VK4KNH

For those who are fairly new at electronics, this might be a good opportunity to gain some understanding of the workings of HF radios. I will take you on a guided tour of the Cybernet via the Block Diagrams. A block diagram is a very simple representation of the circuitry at a functional level. That is, you don't need to understand the individual circuits to follow where the signal is going, and how it is altered as it passes through each block.

Functional Blocks

Before we begin, I should explain that each "block" represents a function, which might require one or more integrated circuits, transistors, filters, or other components which perform a function.

In other words, the term block really means functional block. Arrows show how the signal passes from one block to another, but does not usually indicate the level, path or type of signal. It does not even indicate polarity or whether the signal is ac, DC or mixed.

Note that by convention "ac" is lower case and "DC" is upper case. Rectangles represent functional blocks though some blocks may have special symbols such as a circle with a cross represents a mixer.

Signals in block diagrams generally pass from left to right which is the way most of us read. Note however that at times feedback paths may feed from right to left or up and down.

Dotted or dashed lines may indicate a set of blocks, shielding, or the physical location of a set of components. Therefore you should read any notes that accompany block diagrams, especially if they form a "legend" for the diagram.

Multifunctional Equipment

Block diagrams are also handy when a piece of equipment has two or more modes of operation, which involve re-using some of the circuit functions. A radio such as a CB generally has at least two modes of operation, transmit and receive. Add the ability to be switched between AM and SSB, both upper and lower sidebands, and the circuit becomes too complex to understand without a more simple guide, a sort of cooks tour!

AM Reception

To begin with I will describe the AM Receiver (AM-Rx) referring to Block Diagram 1 as we work through it together.

In the AM Rx block diagram, the antenna is shown on the left and the speaker is on the right which is the left to right path direction mentioned above. Along the center line, you will see an obvious direct path from input to output. Let's talk our way along that path first and then look at some of the signals coming or going, above or below.

RF Amplifier

The first block is the RF amplifier which receives the signal from the 50 Ohm impedance antenna, fed via coaxial cable.

The RF amplifier is tuned at the actual receive frequency, which on a standard CB is the 27MHz band. An RF amp should have a high impedance input to avoid loading the antenna circuit and it should be a low noise amplifier. What is not shown is a Transmit/Receive switch which prevents the transmitted signal from frying the receiver circuitry.

1st Mixer

The next block is a mixer. It mixes the 27MHz signal with a 37.695MHz signal generated by the Phase Locked Loop (PLL) and by filtering, gives a 10.695MHz 1st IF (First Intermediate Frequency).

The 10.695MHz IF passes through Band Pass filters to remove other products of the mixer and also to help confine the bandwidth to that of the received signal, ie 6kHz, (10.695MHz +/- 3kHz).

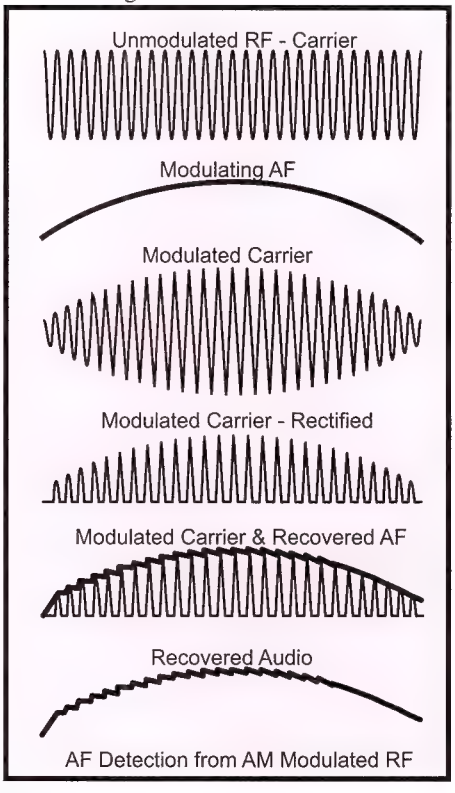
2nd Mixer

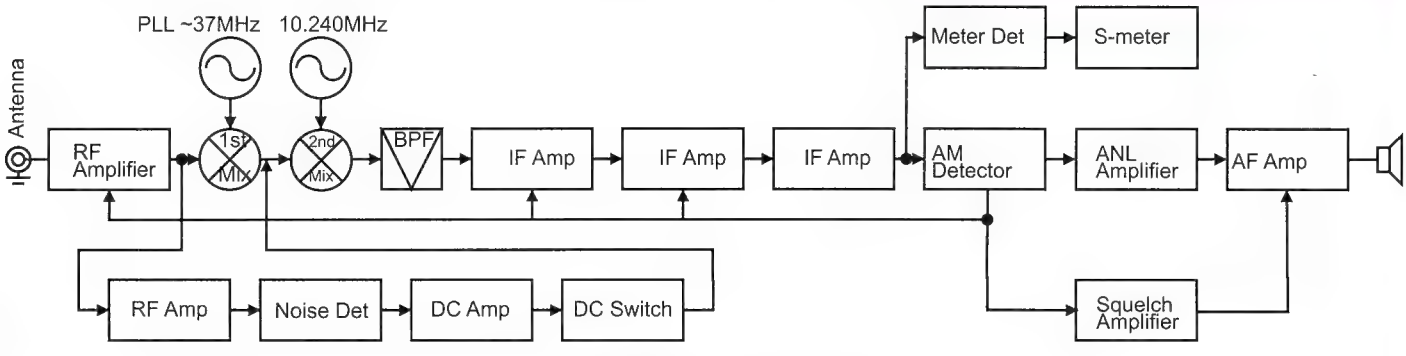
The 1st IF is passed into another mixer, this time mixing with a 10.240MHz oscillator (from the PLL) signal to provide a 455kHz 2nd IF.

The second intermediate frequency is amplified by a series of IF Amplifiers to raise the signal to a suitable level for the AM detector.

Detector

The detector is a simple diode type which rectifies and filters the 2nd IF into an audio signal.





Block Diagram 1 - AM Receiver

Briefly, with reference to the figure on the previous page, when a radio signal is amplitude modulated, the RF amplitude is increased or decreased by the amplitude of the AF signal.

A diode detector first rectifies the RF removing any negative voltage. The signal is then filtered to fill in the gaps between the RF peaks. What is left generally passes for Audio. Of course the AF quality varies from radio to radio.

ANL

The Automatic Noise Limiter, is essentially a filter which, when switched in, filters out high frequencies thus reducing the pass band but limiting higher frequency noise.

The final stage is the AF amplifier which simply increases the Audio signal to a level that can drive the speaker.

PLL

For now, simply accept that the PLL block provides the Local Oscillator (LO) frequencies to select every channel. A thorough explanation of the PLL will be provided later.

Noise Blanker

The noise blanker takes a sample of the RF and amplifies the signal to a level that can be detected. A detector circuit, similar to the AM Detector explained earlier, detects the bursts of RF that we recognise as noise, while ignoring longer smoother voice waveforms.

The detected noise is amplified into a suitable level DC signal by the two DC amplifier blocks.

Those annoying spikes of noise are then used to turn off the RF signal just for the time when the noise occurs. Therefore the noise is removed before it can get to the AM Detector and therefore we don't have to listen to the noise. (Some work better than others of course and some tweaking here can be interesting!)

AGC

A sample of the Audio signal is fed to the RF Amplifier, Mixer and IF Amplifier to reduce the amplification gain of these blocks. Therefore a loud signal will be amplified less than a lower level signal. This is known as Automatic Gain Control.

Squelch!

The last major section of the block diagram for us to cover is the squelch circuit. A sample of the AF signal is again rectified and filtered, this time to provide a smooth DC level. The DC signal that results can be used to turn off the received audio when there is no signal, therefore removing annoying background noise.

Metering

Finally, a sample of the received signal is used to provide an indication of signal strength. The sample is passed through yet another detector and the resulting voltage is applied to a meter that can be calibrated to read S1-S9 and usually +20dB. This is not however an absolute measurement as AGC has been used on previous blocks (Stages).

AM Transmit

Transmitting is actually a simple block diagram if the PLL is ignored until later when it will be explained in detail.

RF Mixer/Amp

The RF from the PLL, 37.66 - 38.1MHz, is mixed with the 10.695MHz local oscillator to provide 40 channels from 27.965 - 27.405MHz. That signal is amplified by the combined mixer/amp, then filtered twice before being fed to the RF pre-driver.

RF Pre-driver

The pre-driver is a buffer/amplifier that protects the RF amplifier from the transmitter load while establishing an RF level suitable to the driver stage.

The PLL also switches the RF Pre-driver off when the PLL is not locked, in order to prevent the CB from transmitting between channels or on some odd-unlocked frequency.

RF Drivers

The driver block consists of a transistor amplifier and tuned circuits designed to increase the power levels in Class-A amplification. (so the modulated signal won't be distorted when transmitting in in SSB mode).

Both the pre-driver and driver blocks amplify while filtering the signal to remove other mixing products, especially higher mix frequencies and harmonics.

Disclaimer:- ESR provide these procedures for licensed Amateur Radio Operators, Two-way Radio Technicians and others properly involved in CB Radio repairs. ESR takes no responsibility for un-qualified repair, tuning, or modification of radio equipment. Note that a poorly modified radio, whether on Amateur Radio bands or elsewhere will be quickly noticed, drawing the wrong kind of attention to your hobby and those who enjoy it with you. If you have any doubts about your capacity to perform these modifications to the standards expected of a licensed radio technician, then seek out one who can do the work for you.

RF Power Amplifier

The Driver and Power Amplifier are both fed by an unregulated DC source which passes through a transformer coil to the transistors. The current to these two power devices can therefore be modulated by a high level audio signal, and therefore the RF power output will be modulated in amplitude, according to the audio that is aplied. That is Amplitude Modulation or AM

RF Filtering

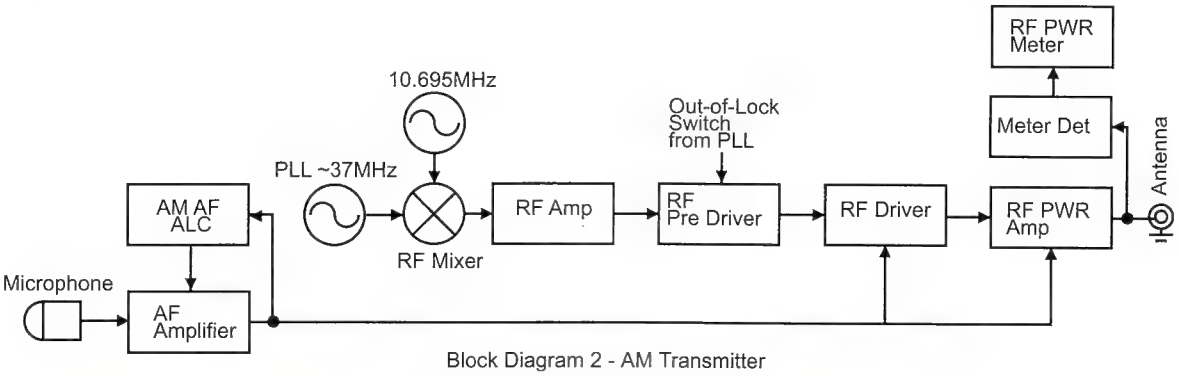
The AM RF signal is matched to the antenna by a Low Pass Filter (LPF) which not only controls harmonic content of the signal, but matches the transistor output to the antenna.

RF Meter/Detect

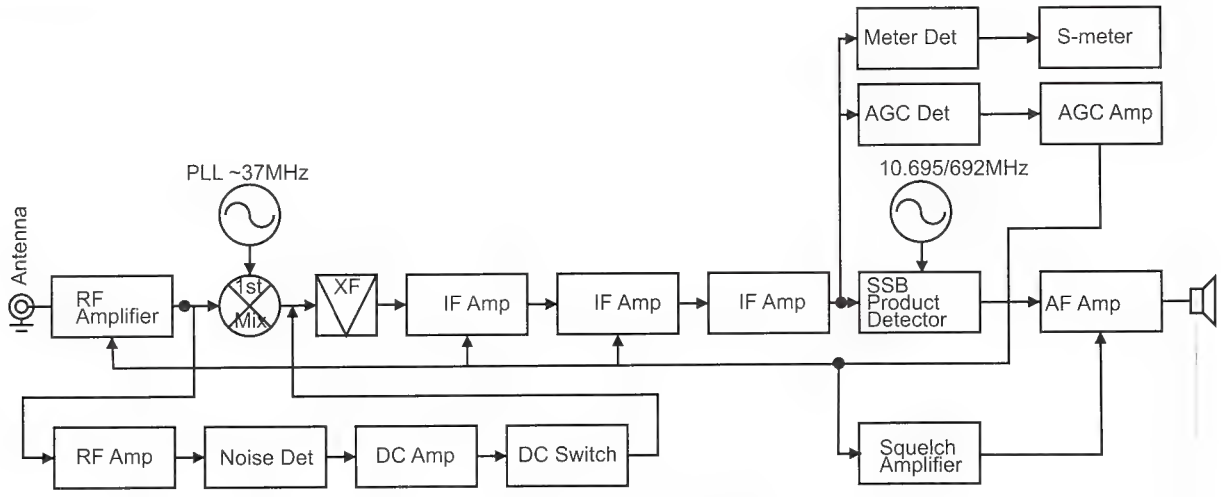
A sample of the RF is detected and fed to the meter to indicate power output. This is simply a DC Voltage level calibrated for a 50 Ohm load antenna, to indicate Power in Watts. A faulty antenna, open or short circuit will indicate a wrong power level, so the meter should always be regarded as an indication only.

AF Amplifier

The microphone is fed to an AF amplifier where the voice signal is amplified to a power level a little less than the RF power output.



Block Diagram 2 - AM Transmitter



Block Diagram 3 - SSB Receiver

Therefore when applied to the modulating transformer, modulation a little less than 100% is achieved. Some of the AF is fed back to the AF amplifier via an Automatic Limiting Control (ALC). The ALC helps limit the modulation when high level signals are fed into the microphone.

SSB Rx

To begin with look at both Rx block diagrams and compare them. What blocks do they share? Which blocks are new? How much can you understand about SSB reception already by looking at this diagram? (Take the time to answer these questions in your own mind before proceding.)

SSB Path

At first there are few differences but let's go through the main signal path. The RF amp and First Mixer are the same items. Notice however that there is no 2nd Mixer or 2nd IF. All of the IF amplifiers are tuned at 10.6935MHz. The Crystal Filter is also different being a 3kHz filter centered on 10.6935MHz, so that it passes only one sideband.

The PLL Local Oscillator signal can be lowered by 3kHz to receive the other sideband (10.692MHz for LSB). The path is nominally 10.695MHz through to the SSB detector, which is a product detector.

The product detector uses a 10.695MHz 2nd Local Oscillator (10.692MHz for LSB) mixed with the IF to produce the AF output (~DC-3kHz). The RF is filtered out and only AF remains to feed the AF amplifier.

AGC Detectors

One detector rectifies and filters a sample of the signal to provide AGC to the receiver stages while another provides a control signal to the Squelch Circuit. The reason for the two is that the AGC needs to react faster than the Squelch control.

SSB Transmit

In the SSB transmitter, the biggest difference is the use of a Balanced Modulator (BM). A Balanced Modulator is a special kind of mixer that adds the two signals to produce only two theoretical outputs, a sum and a difference of the original two frequencies.

If one input is Audio Frequency, then the sum and difference will be the same as an AM modulated signal, except without the carrier. In fact when there is no voice, there is no RF output at all, –assuming it has all been correctly tuned. There are passive BMs and active BMs, the cybernet uses an IC for active modulation.

Balanced Modulator

The BM takes the voice (AF) from an audio amplifier and mixes it with the 10.695MHz local oscillator (10.692MHz for LSB). The resulting Double Sideband (DSB) is passed through the 10.6935MHz Crystal Filter to pass just one selected sideband (LSB -or- USB).

RF Mixer

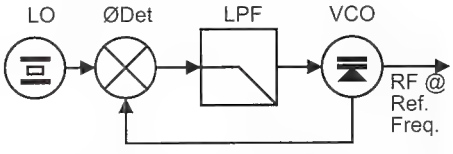
Just as with the AM transmitter diagram, the 10.695MHz signal is mixed with the 37MHz PLL signal to form a 27MHz transmission signal. This SSB signal is amplified by the same stages as the Class-A AM amplifier to produce a clean output.

ALC

The SSB transmitter uses a form of AGC on transmit, which we call Automatic Limiting Control (ALC). ALC helps to reduce interference by limiting the output when voice levels would otherwise over drive the transmitter. Overdriving results in saturation, therefore clipping of the signal which in turn causes harmonics.

PLLs

A basic PLL is shown below.

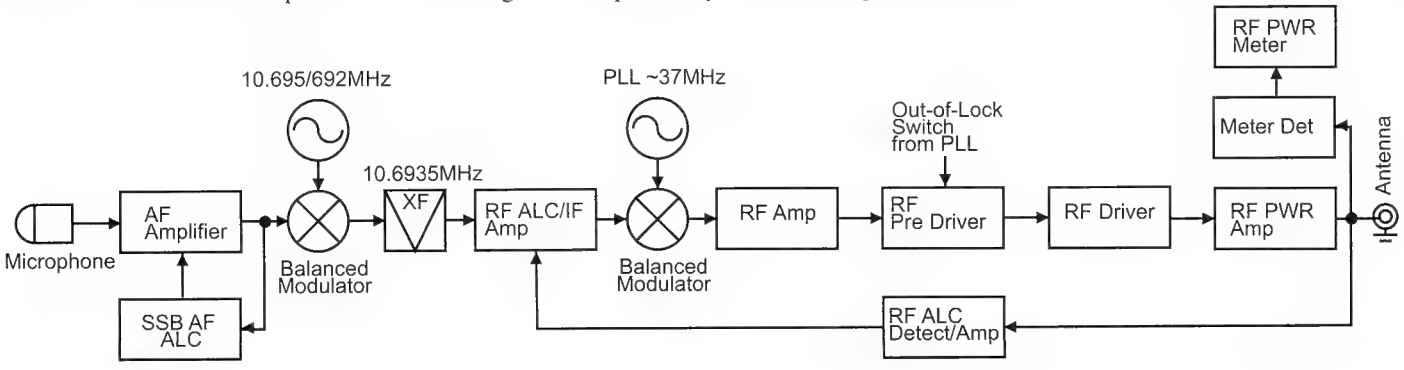


This shows a standard frequency oscillator, eg from a crystal, fed into one side of a circuit known as a Phase Detector (ØDet). A signal from a free running Voltage Controlled Oscillator (VCO), is fed into a second side (or port) and the Phase Detector produces a voltage that is related to the difference in phase between the two signals. The "error" voltage is smoothed in a Low Pass Filter (LPF) which is then used to control the VCO.

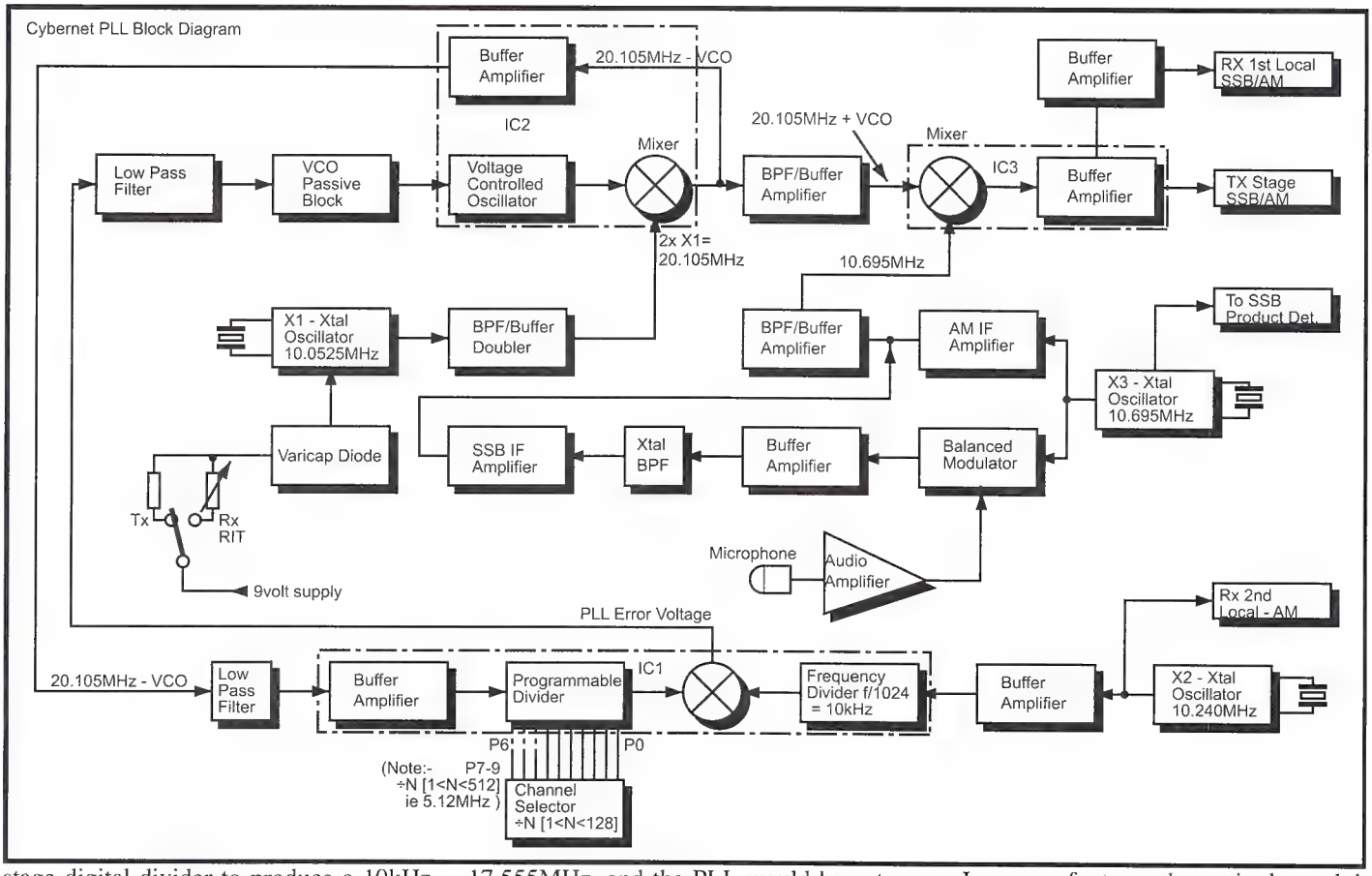
The output frequency is Locked to the input frequency (eg LO) by the Phase difference in the Loop, therefore it is called a Phase Locked Loop (PLL).

Cybernet PLL

The Cybernet uses a 10.240MHz reference (X2 at bottom right of the PLL diagram) which is divided by a 10



Block Diagram 4 - SSB Transmitter



stage digital divider to produce a 10kHz reference frequency, (10kHz channels.) (2^10=1024, 10.240MHz/1024=10kHz) The 10kHz is fed into one side of the phase detector in IC1.

The Error Voltage goes via a Low Pass Filter (Top Left) and the resulting DC level is applied to the VCO block containing a tuned circuit and "Varactor Diode". Varactor Diodes change capacitance when the voltage across them changes. The VCO block is connected to the VCO (-oscillator) in IC2. The output is mixed with the 20.105MHz reference that comes from X1 the 10.0525MHz Crystal Oscillator.

From that mixer the sum of the VCO and X1 become the ~37MHz local oscillator frequency that is used in every mode of the CB. The difference becomes the theoretical 0-5.12MHz that generates up to 512 channels.

(Note there are technical problems that stop us from achieving all 512 Channels.)

That frequency is fed via a LPF to a Programmable Divider in IC1. The channel is selected when the Channel switch chooses what number to divide the channel frequency by. eg for CB Channel 1(US) -26.965MHz, the channel switch is set to 255, or FF in Hexidecimal. To make 10kHz when a frequency is divided by 255, you would have to start with 2.55MHz.

So if 2.55MHz is the difference between 20.105 and the VCO then the VCO would have to be running at 17.555MHz, and the PLL would have to ensure that it was. The sum frequency would then be 17.555+20.105, or 37.66MHz. As a check, 37.66MHz-10.695MHz = 26.965MHz. Bingo!

Let's look at the extreme frequencies, mathmatically at least.

Lower Limit - If the PLL could be set to 512, the output would be 20.105 - 5.12 + 20.105 -10.695, or 2(20.105)-5.12 - 10.695 = 24.395MHz (I'm pretty sure that 511 is the limit so make that 24.405MHz!)

Upper Limit - If the channel switch could be set to 0 (00Hex), then the frequency would be 2(20.105) - 10.695 = 29.515MHz. Unfortunately, as zero difference is approached, the VCO may jump to high side frequency. The filters cannot tell the difference between the wanted and unwanted signal and the operational frequency is no longer reliable.

eg Let's say we wanted to select 29.505MHz the channel selector would be set to 1 (01Hex) and the VCO would try to operate on 20.095MHz.

However it is just as easy for the VCO to operate on 20.115MHz, 20kHz higher and the PLL would still lock as the difference is still 10kHz, but the output would be 29.525MHz. In practice I don't try to go above 29MHz using a standard Cybernet though I have had apparently stable operation on 29.3MHz.

There are some ways around this problem which I will discuss in a future issue. Stay tuned for 29FM!

In a perfect mathematical model there would be 512 output channels from 24.395MHz to 29.515MHz using standard components. In a real set the limits are set by the tuning range of the VCO, which can be increased, and the 10.0525MHz Hetrodyne Crystal X1 which can also be changed!

CLARIFIER

Note that fine tuning on receive is performed by applying a voltage to a varicap diode across X1. RIT -Receiver Incremental Tuning can be extended, or RIT can be made into Rx/Tx operation.

FM CB RADIOS

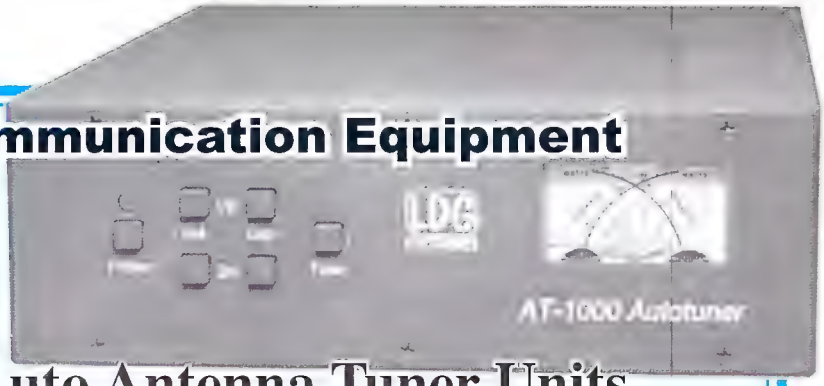
While the block diagrams I have used here are for a standard, AM/SSB set, Cybernet sets have been used in the UK on FM.

The principle is fairly simple. In FM transmit mode the microphone signal is amplified and given some pre-emphasis prior to being applied to the VCO block. In FM Receive, the 455kHz is demodulated by either a dedicated FM Rx IC or a PLL IC, before the audio is de-emphasised and fed to the AF amplifiers. The remainder of the blocks would be used as if in AM mode. (More on this later for those who want a simple 10m FM set.)

MORE ISSUES...

Next issue I will start on the tune up beginning with the PLL and the Transmitter. Hopefully I will have some time between now and then to write up some of the test gear I have made and used.

TTS Systems Communication Equipment



TTS Systems

LDG Electronics Auto Antenna Tuner Units

- LDG AT-1000 One Kilowatt Automatic Antenna Tuner
- LDG AT-11MP 150 watt
- LDG Z11 QRP antenna tuner
- LDG RT11 Remote 125 watt Auto-ATU
- Most LDG products can be supplied in kit form -or-
- Can be supplied fully assembled and tested.

1kW!

NOTE:- 1056 Receiver Kit as reviewed in April R&C -available from stock -$72

Attention QRP & CB'ers

We stock the LDG Electronics Z11 QRP antenna tuner

This little tuner is fully automatic and covers all HF bands. It's an ideal companion for the Yaesu FT817, or other low power rig. It's super compact, (127 x 216 x 32 mm) and weighs less than 0.5 Kg. A useful accessory to the antenna tuners is our TTS-450 4:1 balun. This has a fully balanced high Z output and is perfect to extend the matching range of your tuner.

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TEN-TEC JUPITER DSP HF TXVR

Argonaut V QRP Transceiver
All mode transmitter covering all HF amateur bands
A fully featured general coverage HF receiver
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Evaluation of AA Dry Cells, Duration and Relative Costs.

by Nick Baker, VK2HUB.
Summerland Amateur Radio Club

Nick Baker VK2HUB

Hi Bob,

Nick Baker is 15 yo and has just recently received his amateur radio licence and callsign, VK2HUB.

Needing a project to do for Science at school, Nick's curiosity had been aroused by the relative claims and user results for commonly used AA dry cells. He decided to test them, which he did.

Attached: following are his results as he sent them to me. He did a good job and got top marks and praise from his teacher.

Even the battery makers want his results. It is good to see a young member get a call and do such a project.

73, John Alcorn, VK2JWA
Publicity Officer
Summerland Amateur Radio Club

(I'm sure that older amateurs would be amazed at the standard of work that is required of school students today.

I also suspect that those of us who have experienced trade or engineering levels of education would recognise that Nick is well on his way to becoming an Engineer -if that's the direction he takes. In fact he seems to have a good grasp on what is called "Scientific Method" and his attention to detail is a credit to himself, his parents, and his teachers.

Major science projects at schools around Australia are now far more involved than they were when I went to school, and even since I stopped teaching! Good Luck Nick,

To encourage you further, please accept a 12 month subscription for your efforts –editor)

Diary

I am interested in batteries and electronics and had noticed a big difference in the battery time in my CD player. I also caught the last of an interesting show on TV on batteries as well.

2/8/03 Complete research on Internet on batteries and started the diary.

8/8/03 Complete aim and method for experiment

11/8/03-12/8/03 Away from school sick with flu can't show Mr. Ford aim and method for experiment.

13/8/03 Show Mr. Ford aim and method.

14/8/03 Got mum to buy the batteries.

16/8/03 Complete title page and put the research information on paper, made some changes to method like Mr. Ford recommended.

24/8/03 Early start at 9 am. collected all materials required for the experiment made the foil terminals and then placed the first batteries into the CD player. Worked through the method steps for each battery. Recorded all information. Worked on the computer nearby all day to hear if the CD player stopped between the ½ hr recording intervals. Made entry into diary.

26/8/03 Typed up the results on the computer in table form. Then made some discussion points on the results.

27/8/03 Typed up the conclusion and made tables of the graphs

30/8/03 Read the marking scheme and realized I could get more marks for diagrams so I drew a diagram for the method.

31/8/03 Printed all assignment off, completed diary and bibliography, edited work with mums help and fixed a few typing mistakes and printed final copy.

Background Information / Research

print details email details download pdf

1.5V Alkaline Battery AA (Model: LR6T/2B)

RRP: $3.49 (GST Incl.)

Premium power for longest lasting performance
Designed especially to suit high drain applications
Long shelf life
Safe and reliable design

The demands of digital cameras, mobile phones, gaming, audio & video products, require a new way of thinking about batteries. Panasonic has developed the perfect source of power for your equipment. Whether you are looking for power sources designed for digital cameras, or for leading manufacturers of digital equipment, Panasonic is the right choice. Panasonic batteries are available in a wide range of sizes as well as types of batteries, from the most basic to the most advanced, to suit your equipment.

More Features

Shelf life of 5 years
2 batteries per pack

Specifications

Height
Weight

The Internet contains lots of ads for different battery brands - which ones are the best?

'Alkaline' Batteries

KAA

Voltage: 1.5 volts **Packet:** 2 Pack

Pack Qty: 12 **Life:** Photolife

Usage: AA acount for around 60% of a major cell sales in Pharmacy and Photographic outlets. Many uses coverin cameras and general applications.

Ex GST Inc GST

Background information

Before any lab experiment is conducted, a scientist or engineer will conduct a search for what is known on a subject. That search once involved extensive library searches looking up texts, journals, papers, and even news reports for leads.

Today even the most extensive of searches can begin on the internet, on the researchers own desk, or lap! Information found on the internet can be accepted, rejected, or followed up with a further paper based search, back to the library, or document vault!

Nick seems to have selected materials based on the brands he chose to test, and has catelogued the data as any good scientist would.

The next step is to read the data that has been collected and to decide on what is relevant to the research. Often individual manufacturers will provide data on the performance of their products, but these figures rarely align with the data of other manufacturers. Each do their own tests to the advantage of their product.

BATTERIES

Overview When you need power and long life for your toys, cameras and other electronics, count on Duracell. There are two categories of batteries. General Purpose and Specialty

General Purpose | Specialty

DURACELL General Purpose Batteries come in five sizes: AA, AAA, C, D and 9 Volt.

For long lasting reliable power in the devices you use most, use Duracell CopperTop.

DURACELL COPPERTOP

For photo / electronic devices that require high power, use Duracell Ultra.

DURACELL ULTRA

Certain devices, like cameras, hearing a and watches, have unique power requirements. Duracell markets many di specialty batteries to power a wide varie devices.

Need a specific specialty battery?

CARE & DISPOSAL

♡ Battery Care

Safety Tips

To prevent battery shorting, leakage or rupture:

- Never dispose of batteries in fire, as they could explode.
- Do not attempt to recharge a battery unless the battery specifically is marked "rechargeable."

Use & Care Tips

Follow the easy battery care tips below to get the most out of DURACELL Batteries:

Use the correct size and type of battery specified by the manufacturer of your device.

Keep battery contact surfaces and battery compartment contacts clean by rubbing them with clean pencil eraser or a rough cloth each time yo replace batteries.

Remove batteries from a device when it is not expected to be use for several months.

Remove batteries from equipment while it is being powered by household (AC) current.

Make sure that you insert batteries into your devi properly, with the (+) and (-) terminals aligned correctly. CAUTION: Some equipment using mor than 3 batteries may appear to work properly eve one battery is inserted incorrectly.

Terms Used

Battery - is a set of individual items, eg a battery of cells.

Cell - an electrochemical device consisting of two electrodes separated by an electrolyte. A cell is the basic unit of a battery.

Alkaline - a type of battery in which the cell electrolyte is an alkaline -not an acid.

NiCd - Nickel Cadmium - A rechargeable cell uses Cadmium which is dangerous to the environment.

NiMH - Nickel Metal Hydride - A rechargeable cell whose component chemicals are less toxic on the environment than NiCd.

Lead-Acid - A rechargeable battery of cells that contain Lead and Sulfuric Acid. Best to recycle the lead to avoid contaminating soil with a poisonous metal.

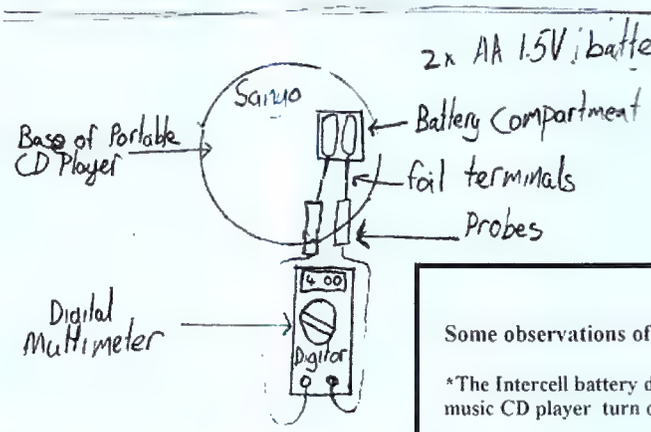
Aim: To find out what brand of battery (AA 1.5V) offers better value for money.

Materials:

1. Portable CD player
2. Aliminum foil
3. multimeter
4. Watch with alarm mode
5. Music CD
6. Various brand of batteries -
   - *Intercell, Heavy duty, Alkaline AA 1.5V pack of 4 $2, equiv to $1 for 2.
   - *Panasonic, Heavy duty, Alkaline AA 1.5 pack of 4 $2.99, equiv to $1.50 for 2.
   - *Eveready, super heavy duty, alkaline AA 1.5V pack of 4 $ 3.87, equiv to $ 1.94 for 2.
   - * Duracell, alkaline, AA 1.5V pack of 4 $6.37, equiv $3.19 for 2
   - *Energizer, E2, titanium (alkaline) AA 1.5V, pack of 4 $7.94, equiv to $3.97 for 2.

Method:

1. Use aluminum foil strips and join to the negative and positive terminals in the battery compartment of the portable CD player to make easy access for multimeter readings.
2. Place the Intercell AA 1.5V battery into the CD player.
3. Connect the multimeter to the aluminum foil terminals. Record the battery voltage output.
4. Turn the CD player on full volume playing a selected music CD.
5. Record the voltage each half hour, or until batteries run flat.
6. Repeat step 2 to 5 for Panasonic, Eveready, Duracell and Energizer batteries. playing the same CD from the beginning each time.
7. Calculate operation time for each of the battery brands and with known price of battery brand, calculate cost per minute of operating time for each.



The Report

Here is a good example of a pretty much standard lab report that engineering and science students in Schools, TAFEs and Universities across the world come to either love or hate.

Aim: - What the research intends to find/test/prove.

Materials: What will be used in the experiment, the materials, and in some cases, serial numbers and calibration dates of all equipment used.

Method: How the Aim will be turned into an operational experiment. The experiment must be designed to test exactly what it claims to test while avoiding influences from other factors. Any experimenter knows that to conduct an experiment, there are fixed paramenters, controlled parameters, and uncontrolled parameters, often random in nature.

The method attempts to minimise changes that can confuse the results, and the experimenter!

Observations: -usually not a part of the report, but good scientific method encourages the recording of events as they may later come to mean something -or explain an unexpected result.

Results: Nick had his raw data but space stopped us from using it. His charts are much easier to follow than raw data.

Conclusion: Many students dread making a statement about what they found, especially when they are sure they have the wrong results and have no time left to repeat or review them.

Bibliography: When a report mentions previous sources, it is good practice to list those sources for other researchers.

Some observations of the results are as follows:

*The Intercell battery did not make the ½ hr. Luckily I was working nearby and heard the music CD player turn off.

*Full Volume on the CD player was used to ensure an acute reading for each battery type. This audio meant the audio amplifier in the CD player was running as would happen in normal use of the CD player. However you would not use the CD player on full volume so in actual fact the batteries would all last longer with normal use.

*Duracell and Energizer batteries had used-by dates of 2009. I could not find any dates on the other batteries. In my research on the internet, I found out that the sell-by dates are important and you should not buy any Alkaline battery with less than 3 years on their 'best-by' labels.

*The terms ' heavy duty' and 'super heavy duty' don't seem to mean anything – just a marketing ploy. The 3 worst performing batteries had these descriptions, but the best performing batteries did not.

*Another point of consideration on top of value for money of battery life is the environmental concern of battery disposal. 5 Eveready batteries per one Duracell battery would fill landfill sites on disposal.

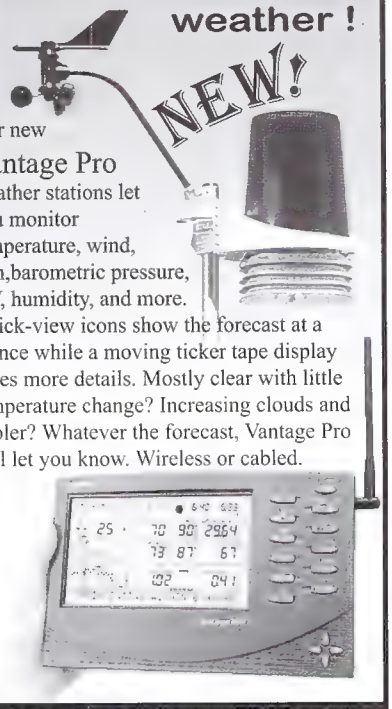
*The voltage of the expensive batteries went down then up and down again as the current ran through the different cells.

* The results have been graphed. These are shown in the following pages. It is easy to compare the batteries from the graphs. The longest lasting battery was the Energizer, however when cost was considered the Duracell came in first, followed closely by the Energizer. The Intracell ran for the shortest time, however when cost was considered the Eveready was the most expensive.

BIBLIOGRAPHY/ACKNOWLEDGEMENTS

• Discovery Channel - I saw an interesting show on batteries 6 weeks ago.
• Mum for helping to edit my typing
• Internet sites used for research. These include...
http://www.panasonic.com.au/catalogue/list.cfm?cat=17_2
http://www.audax.org.au/faq/batteries.html
http://www.duracell.com.au/batteries/
http://www.ata.com.au
http://www.c-direct.com.au/showkodakbatteries.asp?cat=Alkaline

Forecast your own weather !



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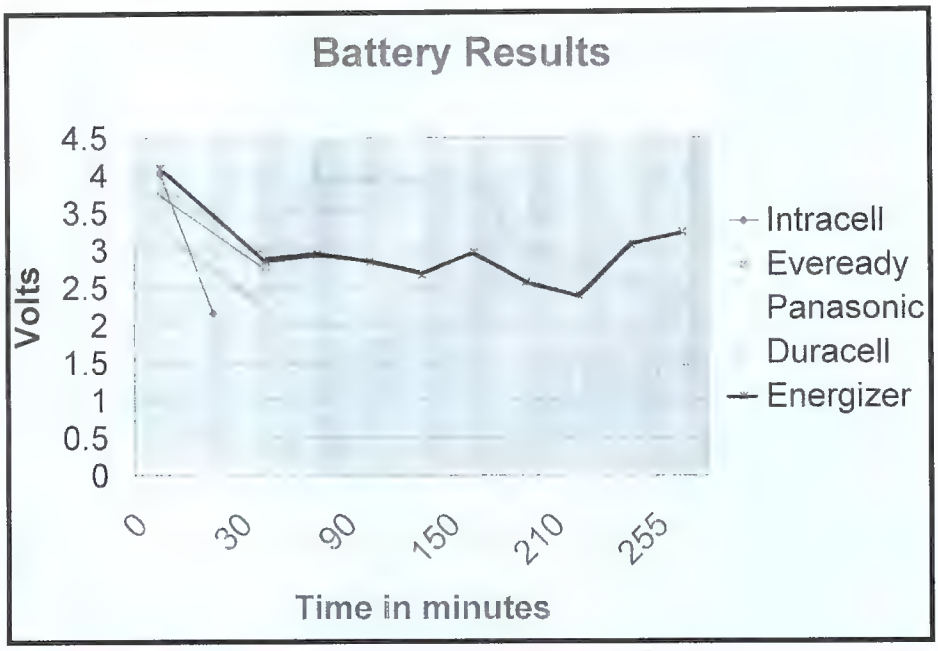

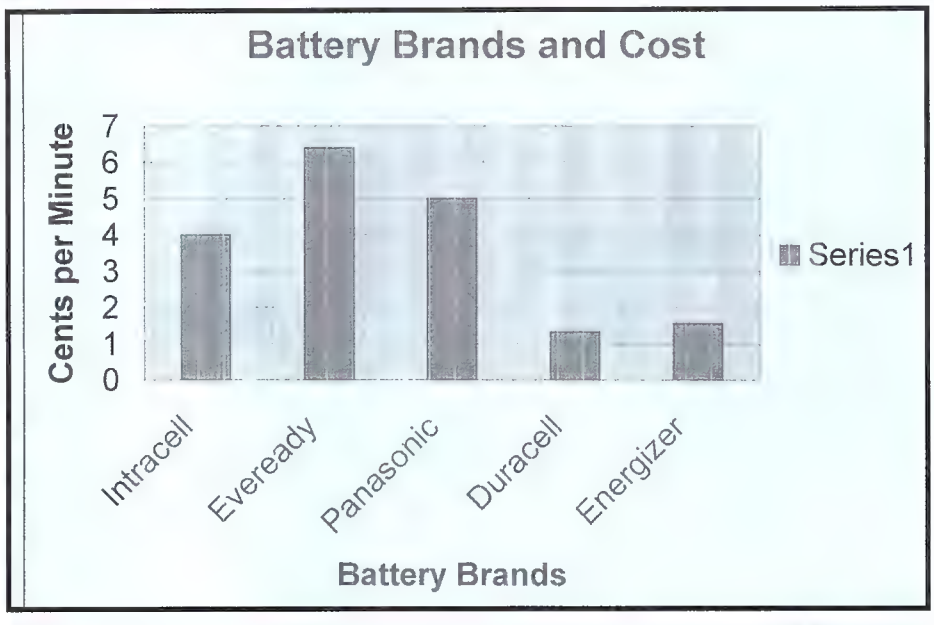

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Conclusion:

The brands of AA 1.5V batteries had a significant impact on the operating time of the portable CD player. Taking into consideration the vast difference in the price of batteries available at a common supermarket chain, some batteries work out to have better value than others.

This experiment showed the Duracell AA 1.5V battery is the best value for money of the battery brands tested. It came in at 1.33 cents per minute to operate the portable CD player. The energizer AA 1.5V battery follows this closely at 1.56 cents per minute. A very large gap between the energizer and the next battery - the intracell at 4.0c per minute was found.

In actual fact the Duracell AA 1.5V battery will give you nearly 5 times more operating time than the poorest scoring battery, the Eveready.

In summary the most expensive AA 1.5 V battery brands (Duracell and Energize) worked out to be the most economical when taking into consideration the length of time they operated the portable CD player. The cheapest battery (the Intracell, Heavy duty) is the next choice but is not recommended. The mid priced batteries (Panasonic and Eveready) were the lest economical and also not recommended. They would also fill landfill sites quicker.

It would be interesting to further investigate rechargeable batteries in another experiment to see how they perform against standard alkaline batteries.

TRAPEZOIDS

by Bob Harper
VK4KNH
bob@esr-mag.com

Some time ago, 1983 in fact, I was given an assignment toward my teaching diploma, to produce a multimedia presentation. Today that could involve a lot of technology, and equipment items we didn't even know of back then, but in 1983, it meant a slide show to accompany the chalk and talk.

I had been teaching amateur radio, and it seemed that a set of slides on modulation might be worth a go. So I took a camera into the lab and away I went.

Well it didn't take as much as I expected and soon I started playing with the equipment. I had set up a couple of BWD Mini-labs (which included a function generator in each) so that one AM modulated the other with frequencies of 1kHz AF and 1MHz RF from memory.

The traces were fed into the two channels so they could be viewed together, and then I pressed the wrong button, the XY mode which uses one channel as the Up/Down deflector and the other as the Left/Right deflector.

Suddenly I saw a pattern that I had often read about, and even taught about, but had not taken the time to set up, or use practically.

The pattern, which is defined and explained in the ARRL handbook and many other texts on radio, is called the "Trapezoid" pattern as it looks like a truncated triangle, and that's exactly what a trapezoid pattern is.

I recognised that this might add a few marks to the assignment, and so away we went.

As mentioned in the review of the RX-340, I remembered this assignment after noticing that the TX-340 had an IF out port that made setting up to read trapezoids very easy.

First - What is a CRO Pattern?

The Cathode Ray Oscilloscopy (CRO) is like a voltmeter, except that you see a dot of light being deflected, instead of a needle. A CRO can therefore allow us to see a kind of electronic graph of what the signals look like.

A ac signal such as Audio can be seen as a sine wave if it is pure enough. An RF signal could be seen as a sine wave as well if the CRO is fast enough, but often we look at it as an envelope, perhaps of the audio signal, top and bottom, coloured in by the RF signal in between. If you could look closely enough you'd see that the envelope is an optical illusion made up of the peaks of the RF signal to cause your brain to interpret it as a continuous signal.

If the signal is kept simple there is no problem looking at it as RF enveloped by an AF signal, but when the AF is real audio, with an ever changing shape, the pattern becomes difficult to follow, and even more difficult to estimate the modulation levels. A better approach is suddenly needed.

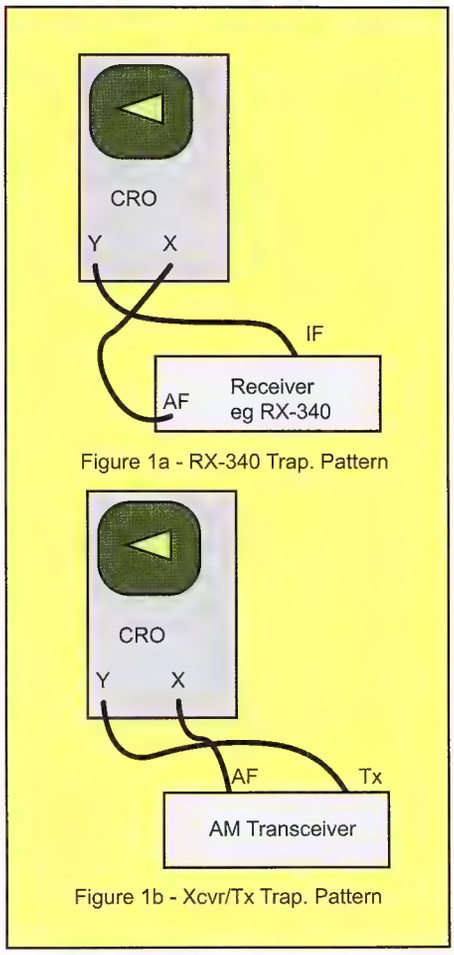
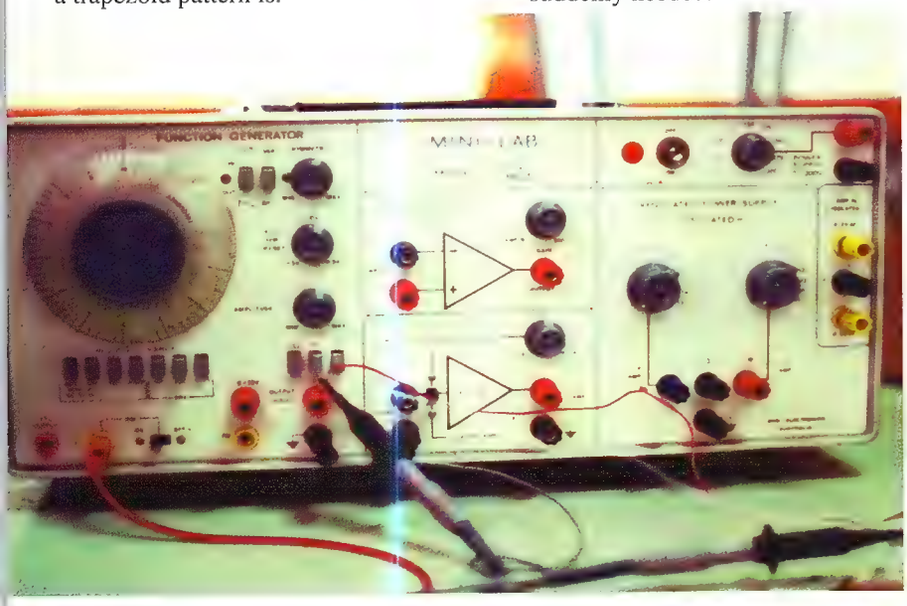
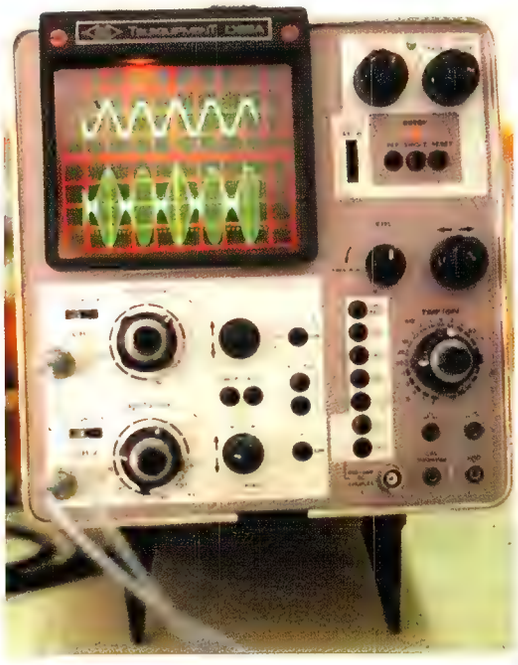


Figure 1a - RX-340 Trap. Pattern

Figure 1b - Xcvr/Tx Trap. Pattern





BWD "603" Mini-lab, and Telequipment D66A CRO

Enter the Trapezoid

CRO screens require two signals to deflect the beam, one for vertical deflection known as the "Y" direction, as I hope you are used to seeing on graphs. The Left side of a Graph for a mathematical function is often the Y axis.

On a CRO this is usually the Voltage of one of the probes, assuming you have two. For the trapezoidal pattern this channel will be connected to a sample of the transmitter output so it will "see" both AF and RF or more correctly, the modulated RF signal. The CRO should be set up so the modulated signal occupies about half the height of the screen. On some CROs the graticule (the ruled grid on the screen) is ruled to show 1/4, 1/2 and 3/4 way up the screen. Mostly however the screen is divided into eight with four divisions above the center line and four divisions below.

Therefore a carrier signal that is unmodulated could be set to fill the middle four divisions. Modulation at 100% levels should cause the envelope to vary from the center line to the top and bottom of the screen.

The horizontal axis is known as the "X" axis. On a CRO this is usually the "Horizontal Sweep" that goes from left to right in a continuously repeating cycle. For the trapezoid pattern however we set the CRO to XY mode, assuming it has one, and use the second channel as the "X" amplifier.

An Audio signal, preferably from early in the AF signal path of the transceiver, is connected to the probe and the gain adjusted to make the signal about as wide as it is tall, about eight divisions. Of course this is up to you and your own preferences, and there is no calibration here.

Figure 1a shows how a receiver can be used to monitor an external, ie received, station. Remember that your receiver may effect the quality of the received signal so a signal that looks bad may be a result of a problem at your end! Figure 1b shows a setup for a transmitter.

What is good - what is bad?

If a signal is clean and is at 100% modulaton, then the trapezoid would be a triangle, as shown in Figure 2a. Note that the arrows show X as the horizontal signal and Y as the vertical. The Audio Sine wave is shown on it's side below the trapezoid (Triangle here) so you should note that one peak causes the smallest height of the trapezoid, zero RF level, and the other peak causes the maximum RF level.

At the left of the trapezoid is a modulated carrier showing how the carrier decreases to zero and increases to double it's usual level, ie non-modulated level. RFmin, RFmax, AFmin & AFmax are indicated so take some time to make sure you are following the argument.

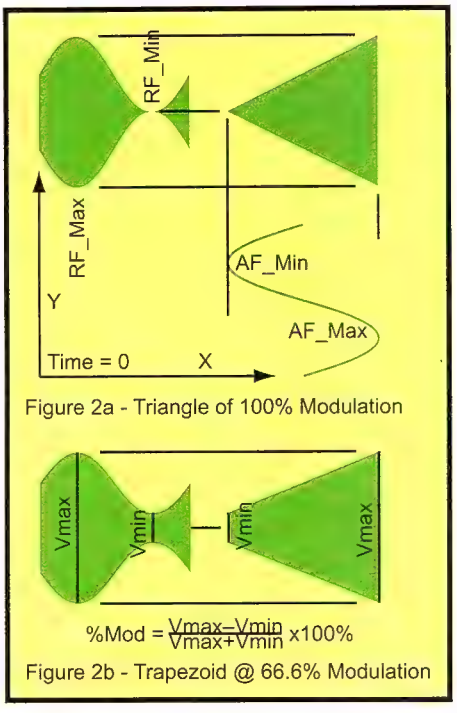


Figure 2a - Triangle of 100% Modulation

$$\%Mod = \frac{Vmax - Vmin}{Vmax + Vmin} \times 100\%$$

Figure 2b - Trapezoid @ 66.6% Modulation

Figure 2b shows a carrier modulated to about 66% -and the formula for finding out the modulation level based on the minimun and maximum signal levels.

Note that it doesn't matter whether the figures are in volts, divisions or cubits! In this example the maximum level is 8 divisions and the minimum level is 4 divisions.

A guestimate might fool you into believing that to be 50% modulation, but a calculated result is 66.7%.

Figure 3a has a low modulation value showing voltage units. Take a little time to try the maths, and I'll give you the answer a little later on.

So apart from calculating modulation levels, what else are trapezoid patterns good for? Well over-modulation and clipping are readily identified from a trapezoid pattern. Look at figure 3b and recognise the two most telling shapes.

Depending on the particular set you are monitoring, when over-modulation occurs, you will see a triangle with a tip poking out the front, or you will see a flattening off of the top and bottom of the trapezoid. You may see both.

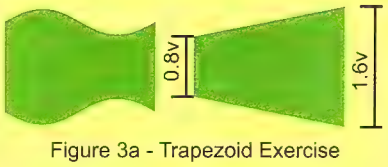


Figure 3a - Trapezoid Exercise

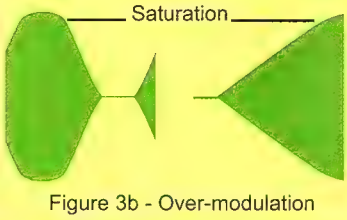


Figure 3b - Over-modulation

Of course the envelope pattern would be easy to recognise at minimum levels, where the envelope becomes a thin line, but the peaks are less distinctive, especially if they are compressed to a curve rather than a flat topped sine wave.

Non-Linear Modulation

If the trapezoid top and bottom shape is distorted through over-modulation then clipping the signal will have the same effect. A signal that has had some form of speech processing applied to it may also show up as a distorted trapezoid if the AF sample has been taken before the processing was applied.

Compression of the signal, through a log amplifier or even an audio compression IC, shows up as a non-linear top and bottom to the trapezoid.

Trapezoids can come to look more like an acorn shape with a smooth curve from the rather stubby point up along the curve to an almost parallel maximum value at the back of the trapezoid.

Voice signals can look like a dancing moth at times with the back of the trapezoid opening and closing to the level of the speech, the point extending like a flicking tongue as the peaks of the voice exceed the maximum modulation levels.

Where the station employs some sort of speech processing with AGC/ALC types of feedback, the trapezoid can be very close to a triangle, with the sides bulging out as compression is applied to higher voice levels.

How do you Connect your Radio to a CRO for Trapezoid Patterns?

Well depending on your CRO and your equipment, you may be able to take an RF sample by wrapping the earth lead of the CRO probe around the Coax a few times and then clipping it to the probe tip.

If your coax leaks enough, or your SWR is crook enough so some RF is flowing down the outside of the braid to earth, you should be able to pick enough of a signal to almost fill the screen vertically. If so you won't need anything else!

On the AF side you need to sample enough for at least a half screen width, and you should take the sample as early in the signal path as possible. If the microphone level is too low, as I suspect most may be, you will need to find the first amplifier.

If you want to regularly sample your signal and monitor it, you should consider adding a socket to the back of the set, and perhaps even using an op-amp to raise the level.

SSB

The bad news is that SSB doesn't have a carrier, and the trapezoid patterns we've looked at here are for AM. My only experience at looking at SSB has resulted in "Pillow" patterns that I can best describe by saying that they resemble rectangles with pointy corners. Maybe I should find the time to see what they tell me! -Bob

This first slide shows an AF channel at top, which is flat -there is no signal applied.

Therefore the second display at the bottom of the screen, which is the RF carrier, is also flat at top and bottom, with no modulation. The envelope is not modulated. If the controls are set the same as they are below, then the carrier is 1000 times the frequency of the AF so it is unlikely that you would see individual sinewaves in the carrier.

In this next slide, the one on the left, a 1000Hz Audio signal is applied to the second generator and then it is set to approximate 100% modulation. The peaks are still clean, and the dips are almost disappearing. The trapezoid pattern is almost a triangle. Note that here the point is on the right which is simply a matter of AF polarity. The sine wave is fairly pure and the sides of the triangle are straight. The glow at the point of the triangle is caused by the time the CRO beam spends there compared with elsewhere.

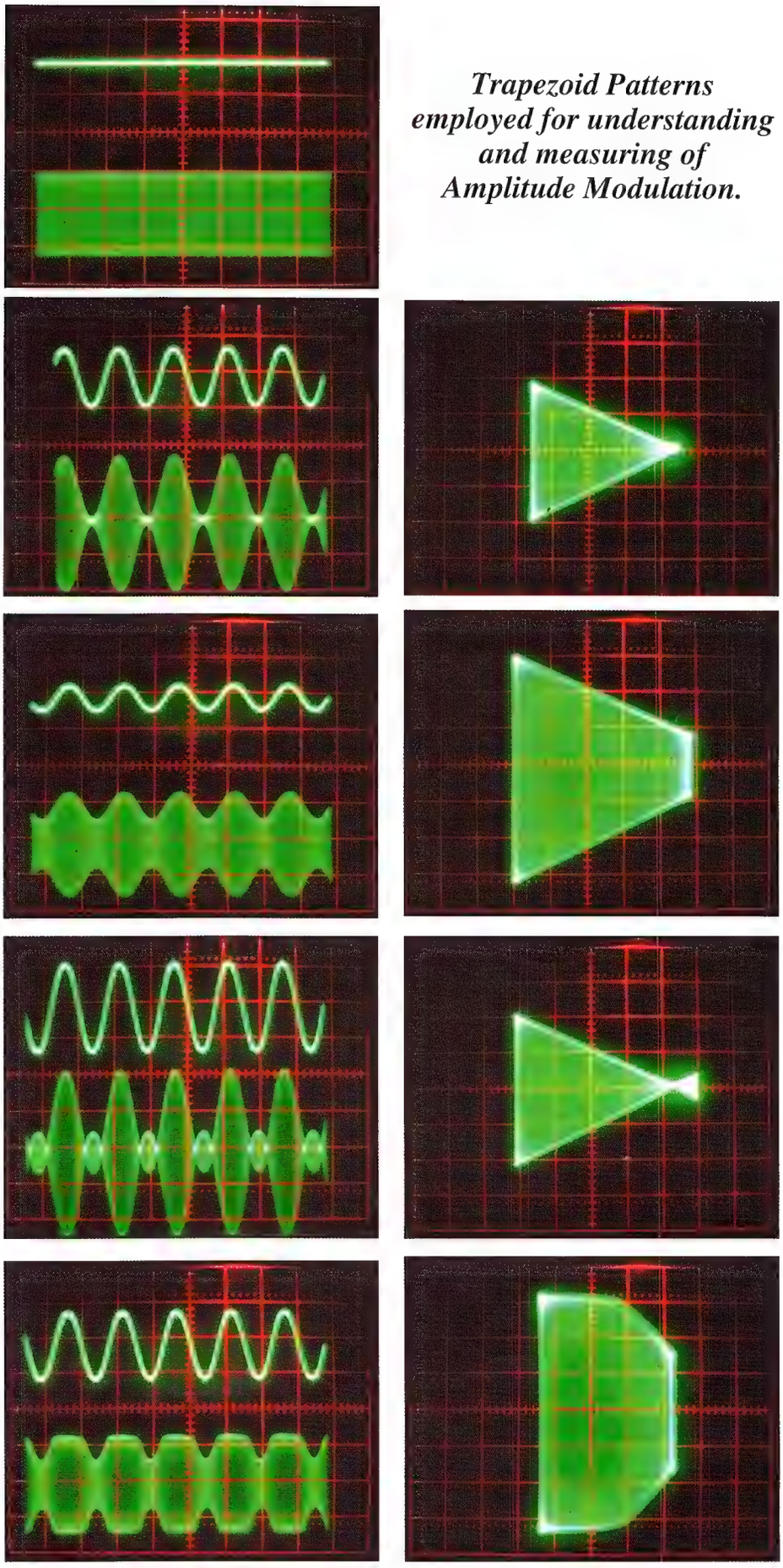
The third setup is of a signal that is "less than fully modulated". Can you calculate the level of modulation used here? Is it easiest to calculate it from the Sine wave envelope, or from the trapezoid? (Note the two will give slightly different answers as the level was apparently changed between setups. Of course you could work out each one for practice - to ensure yourself that you have "got it!") Note again that the sides of the trapezoid are simple straight lines which I think makes the calculation process easier.

In this pair of slides the carrier is overmodulated, but instead of the expected flattening off at the zero points, the signal crosses over, very graphically in the trapezoid. I think this is a result of a balanced mixer IC used in the mixing process of the 603B Mini-lab. The IC is a MC1445 which I have not been able to find the specs for.

Normally you would see a flat line between the larger sine wave peaks, and a single line from the point of the triangle.

The final pair of slides shows the effect of DC bias on the modulating AF signal. In this case the effect is exaggerated by a large DC offset which has caused the carrier to be mostly uneffected by the AF signal except for the lowest negative peaks. The sides (actually the top and bottom on the CRO screen) of the trapezoid are greatly distorted and it should be obvious to any observer who has looked at a few trapezoids, that there is a problem. Similar distortions to the expected straight line result from non-linear modulation, and from speech processing circuits within the radio.

The AF should be sampled early in the signal path to gain the best measure of non-linearity in the modulation process.



Trapezoid Patterns employed for understanding and measuring of Amplitude Modulation.

TECHNICALLY Speaking

by Ron Bertrand VK2DQ email: tech@esr-mag.com

Welcome to another installment of Technically Speaking and your new ESR-magazine. As promised this month we continue on with Baluns and specifically the "transmission line balun". I also promised last month to tell you about a free program that is a great utility when working with ferrite and iron toroids or rods.

Mini-Ring-Core-Calculator

Mini-RC is written by Wilfried Burmeister, DL5SWB and is free for use by Radio Amateurs. This small Windows program (<500Kbytes) has a database of most popular material and core types. The program supports core products from Amidon, EPCOS (successor company of Siemens Matsushita Components) and Ferroxcude (Philips)

Those that have used cores will know how annoying it is to continually look up data tables for specific core shapes and types to try and work out if you can get the required number of turns on to a core for a specific inductance.

Take the calculation we did last month. We wanted an inductive reactance of 200 Ohms at 3 MHz. We calculated the required inductance from L=Xl÷2πf to be 10.6 μH. We wanted to use a FT140-61 core. The FT in the core designator means "ferrite toroid", 140 is the outside ring diameter x 0.01 inches and 61 is the material type.

In other words can we make an inductance of 10.6 μH on an Amidon FT140-61 core?

Figure 1 shows how I used the program to do this. I clicked on the Tab for "Amidon cores" then selected FT140 from the drop down list. Then type "10.6" (our desired inductance) at the centre left. That's all there is to it. Mini-RC reports that we will need 8.7 (9) turns to achieve this inductance in this core size and material. The length of wire required is 33 cm and the "maximum" wire diameter is 8.2 mm. In most applications you would not use the maximum wire diameter of course.

The program also reports a number of other useful parameters. The physical size of the core – inside and outside diameter plus height of the toroid. The AL which we explained last month. The recommended bandwidth depending on the type of application.

Now we wanted a reactance 200 Ohms from out 10.9 μH inductance at 3 MHz.

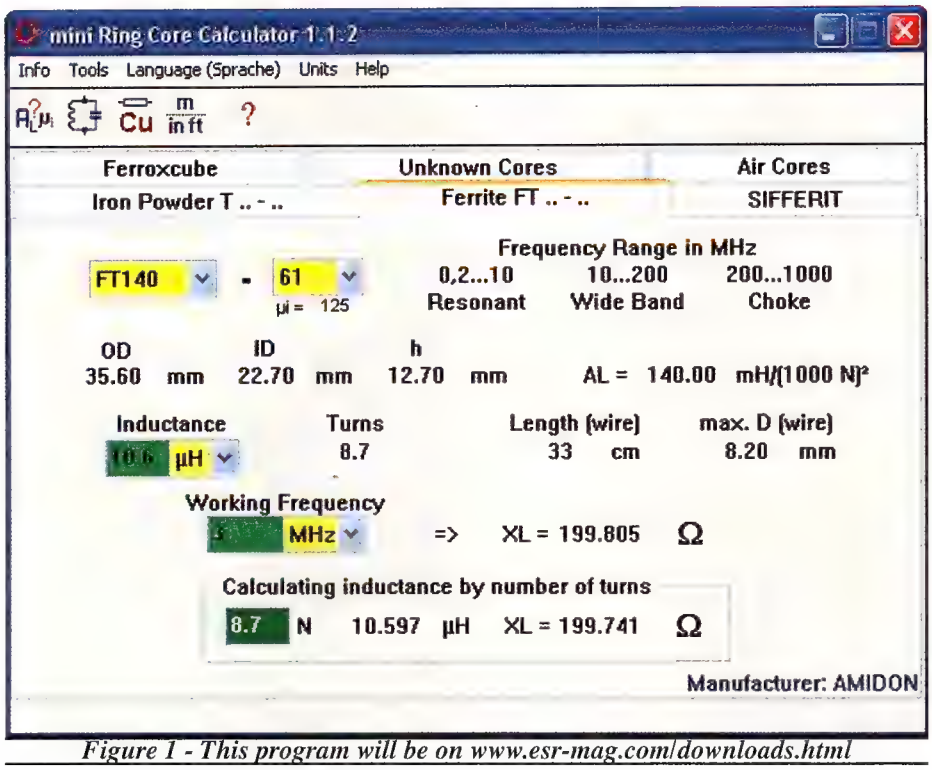


Figure 1 - This program will be on www.esr-mag.com/downloads.html

This is easily checked by typing in "3" and selecting "MHz" where it says "Working Frequency". To the right we see the inductive reactance displayed as 199.805 Ohms. Or we can type in the number of turns and display the reactance – handy for making small adjustments in the turns.The program has a number of other utilities. For example you can find resonance of an L and C or work backwards and get L or C from F. Resistance of a length of copper wire. Unknown core parameters can be determined. Conversion between inches and millimetres and temperature conversions. Finally a feature I really like is an American Wire Gauge (AWG) look up table - that is - AWG to diameter in inches and millimetres. Wilfried Burmeister, DL5SWB has made a very handy utility for those using Ring Cores. Get your copy from the ESR website www.esr-mag.com

Transmission Line Transformers

The most popular type of Balun and the type most often used by Radio Amateurs is the Transmission line type. These Baluns are also widely misunderstood. It does not help when amateur radio literature going back to the 1950's contains much conflicting information or unsubstantiated claims.

Often when fallacies survive for a long time they become entrenched and more or less accepted as fact.

An exhaustive treatment would require a book. We will try to cover the essentials here and perhaps dispel some of the worst fallacies.

I think one of the major misconceptions comes from the fact that a transmission line Balun looks like a transformer. That is, it looks similar to a conventional mutually coupled transformer which also can be used as a Balun.

That name is also confusing. A "Transmission line Balun" does not mean a balun used in a transmission line. Though it is used in a line this is not what the name means.

Such a Balun is one that uses "transmission line principles". Last month we discussed the half wave transmission line transformer, the 1:1 "Bazooka" balun and the choke balun. All of these are Baluns that operate on transmission line principles.

Parallel wire (or coaxial cable) lines can be wound on to ferrite cores or even air cores to create a balun effect. When a toroid or rod is wound with a parallel wire transmission line it may appear on casual inspection that it is a conventional mutually coupled transformer – it is not.

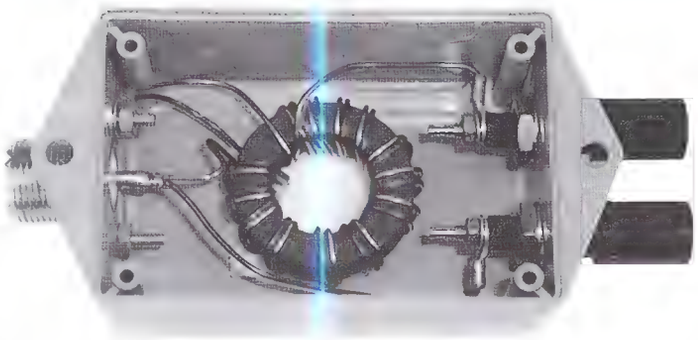


Figure 2 - 4:1 Ruthroff Transmission Line Balun

Figure 2 shows a 4:1 transmission line (Ruthroff) 4:1 balun supplied as a kit to ESR by TTS Systems. When we look closely at these types of baluns we find some very interesting features. Firstly the magnetic core is nearly passive when it comes to transferring energy between input and output. Ordinary mutually coupled transformers are effected by a degradation in balun action at high frequencies due to the transformer acting more like a capacitor as frequency is increased. Transmission line baluns on the other hand have an astonishingly wide operating bandwidth. They don't appear to have enough windings on them and it seems hard to believe that such small devices can transfer so much power.

The reason for this is that the "windings" of a transmission line balun are not windings at all. What we have wound around the toroid is a very short "transmission line". There is no reliance on inductive effects between what "appears" to be windings. These short transmission lines are less than 1/8th λ (λ/8). The coiling of the very short line around a toroid has no direct electrical significance. It is done more for practical convenience. It enables the transmission line to fit into a convenient small space and brings the "opposite" ends together for easy interconnection. Remember we can coil these transformers from parallel or coaxial line. It makes no difference provided the correct impedance of line is used. If we can wind them from coaxial line then it should be obvious that we are not relying on mutual inductance – (the linking of magnetic fields) for the operation of these transformers.

One of the most common 4:1 Baluns used by radio amateurs is the Ruthroff as shown in the photo. (figure 2). The Schematic of this popular balun is shown in figure 3.

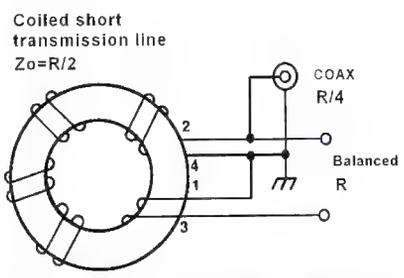


Figure 3 - a Ruthroff Balun

The characteristic impedance of the coiled transmission line should be the geometric mean of the input and output impedance. This is a 4:1 balun so it could be used to match 200 Ohms (balanced) to 50 Ohms (unbalanced). The characteristic impedance of the short length of transmission line wound around the toroid should be; Zo = √ (Rin x Rout) = √ (200 x 50) = 100 Ω.

Now it is often wrongly thought that a 4:1 Transmission line Balun can be used to match any two impedances with a ratio of 4 to 1. Not so. A 4:1 balun designed to match 200 to 50 Ohms cannot be used to match say 25 to 100 Ohms. The characteristic impedance of the line would on to the toroid is an intrinsic parameter of the design. The Zo of the line wound on to the toroid is a determining factor of the input and output impedances to which the balun can be connected.

Hopefully you are beginning to see how different these devices are from conventional transformers – though this critical difference is not always stated in much of the popular literature including some major handbooks.

In practice the three impedances (Rin, Rout and Zo of the coiled line) from the equation given above can vary somewhat the balun will still work. For example the Zo of the coiled line in the 4:1 balun shown in figure 3 above should be exactly 100 Ohms. If you think about what determines the Zo of a transmission line you should realize you can't just wind a balun with any two wires of any diameter and with just any old insulation as it is the size of the wires and their distance apart and the type of insulation between them that determines the Zo of the line that they produce. There are a few who go to great lengths to get this just right. In practice you don't have to be too fussy – I will be giving you some construction details of popular baluns later.

If you look at the balun in figure 2 you will notice how the spacing of the line around the toroid varies slightly in a couple of spots. Well this would mean that there is a variation in impedance at those spots. It would be better if the two wires making up the line were bound together every 10-15 mm with a narrow strip of tape 3-4 mm wide.

Having said how it should be ideally, small variations in spacing (and consequent aberrations in Zo) don't seem to matter that much. I fully tested the balun in figure 2 using an impedance meter and it had an SWR of 1.3 to 1 or less from 2-30 MHz.

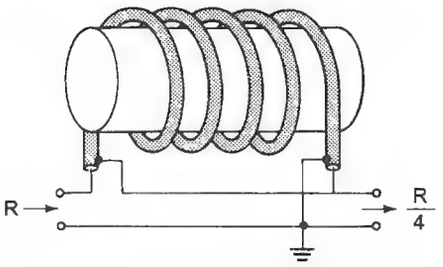


Figure 4 - 4:1 Balun using Coax

We mentioned that the type of transmission line used to make the balun is not important as long as its characteristic impedance is correct. Figure 4 shows the same (as in figure 3) 4:1 Ruthroff Balun made using coaxial cable and coiled around a ferrite rod. Here it is even more obvious that the magnetic core does not influence the transmission line. The core does not participate in the transfer of energy as in a conventional transformer. This is why high power baluns can be such small devices. However the use of the core does not effect the high frequency operation of the balun but it does extend the lower frequency of operation. A balun without a core will not work well at low frequencies.

Figure 5 is the schematic diagram of the balun. Please look at figure 5. The terminals 1 and 3 represent one end of a short parallel or coaxial transmission line. Terminals 2 and 4 the other end. I think it is the common use of this type of schematic which leads to the misconception that this type of balun relies on inductive transformer action. The coil symbols are not meant to imply inductive coupling. However we do have the property of inductance from end to end. Looking at the schematic you can seen that coil (3-4) is in shunt across the output. It appears to be short circuiting the output. There really is no short circuit because the line element (3-4) does present an ordinary reactance in shunt with the output terminals. The important thing to understand is that this shunting reactance comes from the line elements behavior as a single conductor. The shunting reactance has nothing to do with the (3-4) element working in conjunction with the (1-2) element to form a transmission line.

This undesirable low frequency shunting action of element (3-4) is reduced if the inductance is increased. A higher inductance in element (3-4) means a greater low frequency response from the balun.

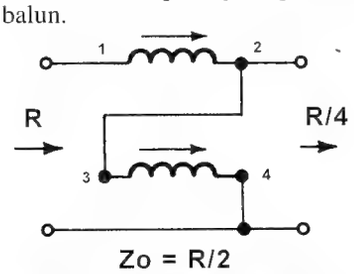


Figure 5 - Schematic diagram of a 4:1 Ruthroff Balun

How can we increase the inductance of element (3-4) without changing the characteristic impedance of the line?. Well we would wind the transmission line into a coil. If this is done on a toroid it also brings the ends close together for easier interconnection. The effect of a ferrite core is to make element (3-4) a more effective RF Choke. So we use a core really just to extend the low frequency response of the balun. As we go up in frequency the length of the coiled transmission line up gets longer in wavelengths. As the length of the line approaches 1/8th wavelength the high frequency response rolls off and the balun becomes ineffective.

The Ruthroff type baluns have become to be more commonly known as "voltage" baluns in recent years. The other type of balun is the Guanella. This type is commonly referred to as a "current" balun. Whatever can be done with a Guanella can be done with a Ruthroff. Some recent literature criticizes the voltage balun when compared to the current balun. I do not believe there is any sound technical reasons for these criticisms. Which type of balun is used is a matter of personal preference. Personally I find the Guanella (current) Baluns easier to construct and a little more tolerant to variations in impedance. Though I haven't done any tests to prove if that really is the case. However there is little difference between the two and I would never suggest you don't use a Ruthroff or one of its variations.

One-to-one Baluns

We use a 1:1 balun when we don't need an impedance transformation. Figure 6 shows two popular and effective 1:1 transmission line baluns. I prefer the Guanella type for ease of construction. This Balun is just what it looks like. It comprises a transmission line of characteristic impedance equal to the line in which it is to be placed coiled around a ferrite rod or toroid. The coiled transmission line of the Guanella forms a choking reactance that allows only transmission line currents to flow. That is current flow within the line only. The choking reactance isolates the output from input and only flux canceling transmission line currents are able to flow. This is the reason why this type of balun has been in recent years referred to as a "current" or "choke balun".

Making a 1:1 Guanella Balun.

The Guanella 1:1 balun is a short length of transmission line, of any type, usually wound on a low permeability (μ 50-250) toroid or rod.

The characteristic impedance of the short line should be equal to the impedance of the system. If you're using the balun in a 50 ohm system, then the line used to wind the balun should be 50 Ohms. The balun should be used in its

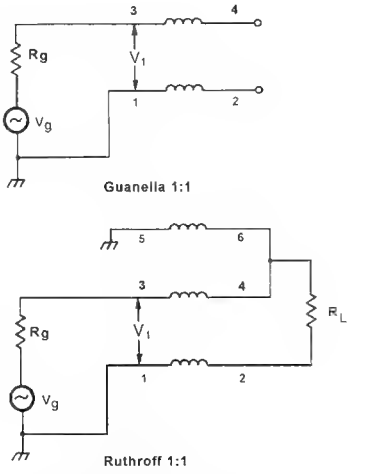


Figure 6 - 1:1 Baluns

impedance.

It should not be used in a system mismatched by more than 2:1 (VSWR) for best results. As the SWR increases there will be a higher voltage gradient along the length of the coil transmission line resulting in increased dielectric type losses.

Since the line is short it is easy to wind the toroid with parallel line or small size coaxial cable.

There are two common methods of winding a Guanella 1:1 Balun. These are both shown in figure 7. I have used coloured wires here for photographic

Figure 7 - 1:1 Guanella Baluns

purposes.

You should view the winding as 50 Ohm transmission line if the balun is to be used in a 50 Ohm system. The wound toroid should be mounted in a box – metal or plastic it does not matter. Either end can be input or output. One end should be soldered to your coaxial connector (usually SO-235) and the other terminated on two strong posts for connection to your balanced antenna input.

The Toroid shown is an FT200-61. It's about 50 mm outside diameter and has a permeability of 125 (material 61). The transmission line can be made from #12 (about 2mm) to #16 (1.29 mm) enameled wire.

Don't forget you can use Mini-RC to convert AWG wire size to millimeters and also to look up a toroids permeability and physical size. Remember the characteristic impedance needs to match your system. This is usually 50 Ohms. A small deviation in impedance is acceptable. The actual impedance of your two wires is dependent, like all transmission lines, on the size of the wire and the dielectric between them. Do not twist the wires.

The winding shown is usually referred to as "bifilar" – many think this means the wires are twisted together – don't do this. Don't think that if 10 turns is good then 20 turns is better. More turns will work okay (particularly with coax) but is unnecessary and the high frequency losses increase. Instead of parallel line you could use small size coaxial cable such as RG400/U or similar. Small size cable is only necessary so that you can wind enough turns on the toroid.

The winding method on the right of the photo is often referred to as a "magic crossover". Its proper name is a Reisert's 1:1 Balun. It really is just a Guanella with a crossover on the toroid. It is not a "magic" anything! Whilst it looks a bit more formidable than the previous photo, electrically these devices will work exactly the same. This method may have an advantage when using coaxial cable and you need to distribute the turns around the toroid to get your 10 turns.

Using Ferrite Rod

Ferrite rod works well but the impedance may vary toward the upper end of HF. It does work and it does work well and its even less expensive. About $3-4 at most popular parts stores and has a permeability of 150. You can wind it with RG58 or similar and have connectors on each end. A popular mounting method is to place the entire assembly into a length of PVC pipe with end caps.

Standing Waves

You can use the 1:1 balun with standing waves if you accept that the losses may be higher. If the standing waves are too high flashover between the turns may occur. Standing waves can significantly increase the dielectric type losses. With high SWR sometimes it is the added losses of the balun that actually make the SWR appear better.

Another type of 1:1 Balun is the three wire Ruthroff (The bottom of figure 6). I have made and experimented with is type and compared them to the Guanella by taking measurements. I can find no advantage in using the Ruthroff for a 1:1 Balun over the Guanella. The Ruthroff is also slightly harder to construct.

The 1:1 Guanella Balun is a basic building block for a range of baluns. It is easy to use two 1:1 Guanella Baluns to produce a 4:1 (or 1:4) impedance transformation. You can coil two 1:1 baluns on to each side of a toroid. At the low impedance end you connect these two transmission lines in parallel and at the high impedance end (four times higher) the lines are connected in series. This will be obvious if you look at the schematic diagram of the 4:1 Guanella balun in figure 8. In figure 8 we simply have two short transmission lines.

One line is formed by elements 1-2 and 3-4. A second line is formed by

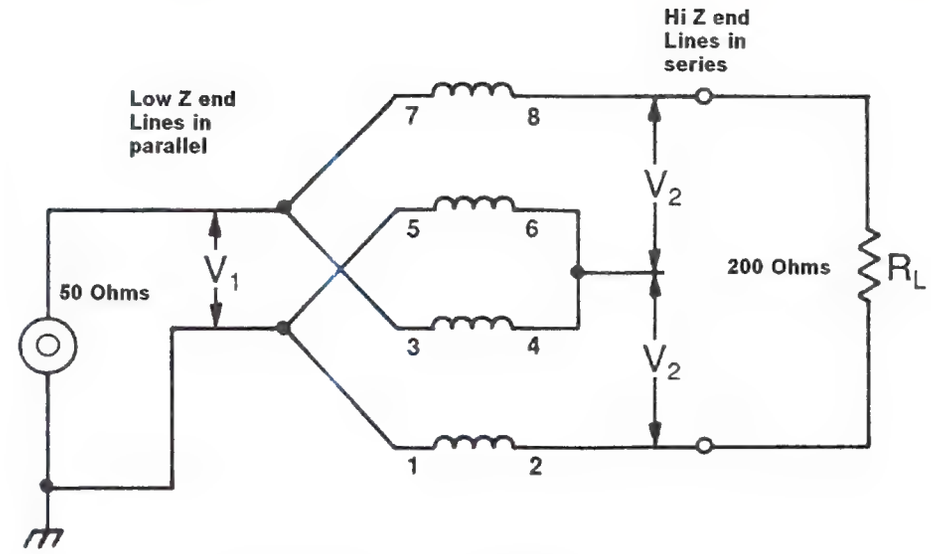


Figure 8 - 4:1 Guanella Balun Schematic

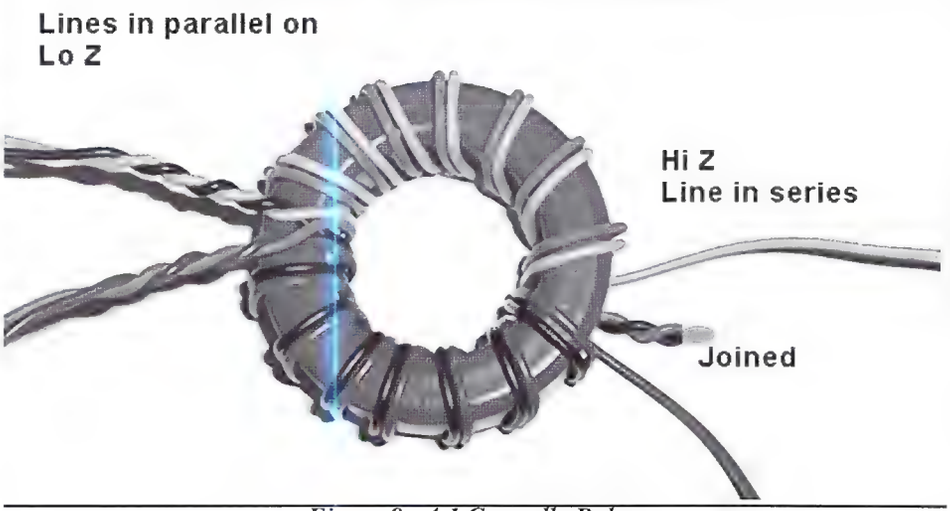


Figure 9 - 4:1 Guanella Balun

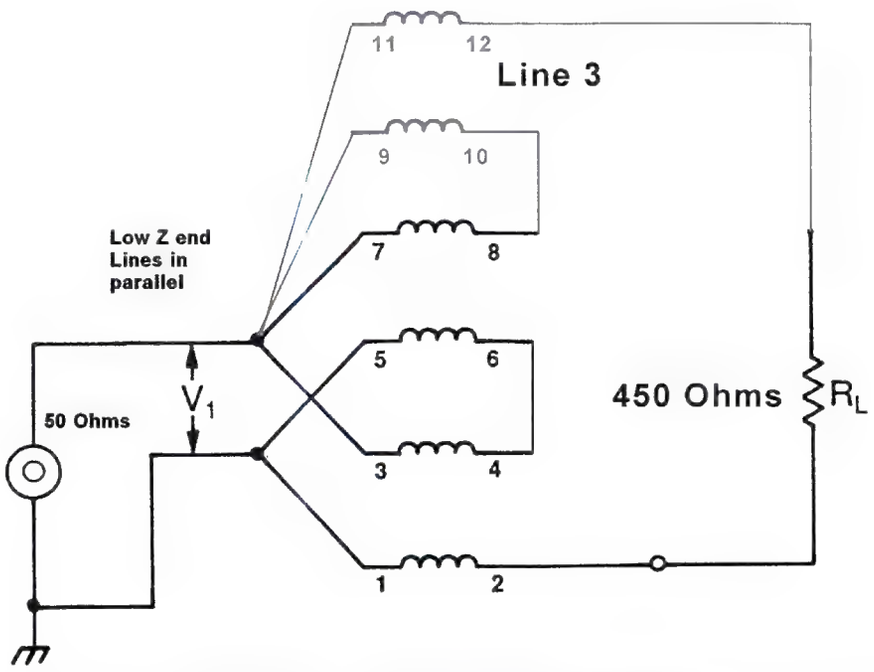


Figure 10 - 9:1 Guanella Balun Schematic

elements 5-6 and 7-8. Each of these lines taken in isolation form a 1:1 Guanella balun. On the low impedance side they are connected in parallel and on the high impedance side they are connected in series. The phasing of this connection produces a 4:1 impedance transformation. The two 1:1 baluns can be wound on separate cores for very high power use or for most purposes on each side of a single toroidal core will be fine.

Figure 9 is a pictorial diagram using coloured wire to further illustrate how two 1:1 baluns are configured to produce a 4:1 transformation. The optimum impedance of the line used to wind this balun is as before the geometric mean of the input and output impedances. So if our 4:1 balun is matching 50 to 200 Ohms the line impedance making up the balun should be; $Zo = \sqrt{(200 \times 50)} = 100\ \Omega$.

We have seen how a simple 1:1 Guanella Balun can be easily extended to a 4:1 Balun. If we wanted a 9:1 balun we would add another transmission line to the 4:1 balun. We do exactly the same as before. Parallel all three lines on the low impedance end and series them on the other end. If our 9:1 balun is to be used to match 50 to 450 Ohms then the characteristic impedance of the three lines should be 150 Ohms (the geometric mean). With three lines we have six wires. These can be successfully wound on to a single toroid or each line could be wound on to its own toroid and the three then stacked. Rather than draw the schematic from scratch I think it is instructive to see how the 4:1 of figure 8 can be modified by the addition of an extra line to make a 9:1 balun. This is shown in figure 10. Have a look at the differences between figure 10 and figure 8 and you should get the idea.

We have covered the most useful Baluns likely to be used in Amateur radio. The 1:1 and 4:1 account for the most balun applications in Radio. Balun Guanella and Ruthroff baluns can be made for other transformation ratios. For example 6:1, 2:1 and even fractional transformations are possible. All are extensions or combinations of the baluns discussed thus far. To cover them all would be to write a book and a couple of excellent works have already been done by Jerry Sevick W2FMI. In particular I'd recommend his constructional book "Building and Using Baluns and Ununs – Practical designs for the experimenter". It is available from the WIA bookshop. Well that's it for this month. I hope those transmission line type baluns are not quite the mystery to you that they may have been. Till next time....

73 Ron

feedback

feedback is chaired by Bob Harper VK4KNH

Send your feedback by mail to Feedback, ESR magazine PO Box 288 Beerwah, Qld 4519, or to the editor@esr-mag.com, or online through http://www.esr-mag.com/feedback.html,

First up this month, a few quick questions and answers from our web site feedback page.

From: Michael - just wondering if you are going to bring back a military hf monitoring column ?

Yes, in a way, "Caradoc" is writing for ESR is a column we have called "DC to Daylight". There's military scanning and some hints and clues on other targets as well.

From: Graham VK6RO - gday, what about us who were ripped off by the last magazine... subscriptions? will we get esr to fulfill our subs?? -and-

(Name withheld) - I notice that Radiomag has lodged an application to wind up the Company. What does this mean for the subscribers and more importantly the magazine?

No, RadioMag did not lodge an application for liquidation, at least not as far as I know. It was a victim of somebody else wanting to wind it up, but, on subscriptions... I initially received a lot of positive mail about starting this magazine, to fill the void left by R&C. Since finally managing to achieve that, I have received a few emails from people asking where their subscriptions went. I regret that I cannot do anything about the subscriptions, no matter how much of a "nice chap" that would make me. You need to contact Ferrier Hodgson who I believe have written to all subscribers.

Paul - Hi, Just wondering when a scanner related column is going to be back in the magazine?

Some Scanner materials are in the DC to Daylight column we start this month, and I hope more will follow, but I am not a scanner person, so I need to know what you want. Follow up with more feedback and fill in the survey.

From: Paul Blundell -Radio scanning group. Just created a Yahoo group for radio scanning, here are the details if you could include them in the magazine to help me get more members.

Group: radioscanaus

Post message:

radioscanaus@yahoogroups.com

Subscribe:

radioscanaus-subscribe@yahoogroups.com

OK Paul, Good Luck with it.

Ray - The new version is very good, however you may consider using less expensive paper, such as that used by Silicon Chip.

That's polite! If I used less expensive paper it would have to go through a more expensive printer. It's all a matter of balance and timing. Is this paper OK?

Don vk2zc - I bought your mag today 8/9/03 at Wyong. Tried to get the graph papers and other downloads, all I got is error 404 message. Couldn't find the Survey .PDF form either. Like the crossword puzzles, missed them when EA stopped them. Good luck with the mag. It would be good if the whingers gave you a fair go and bought the mag instead of complaining about what's NOT in it for them.

I like the whingers, (Some of them?) they keep me on the go! Sorry about 404 messages, I hope I've fixed that and all the downloads are either available or links removed.

Some more web development will happen over the next few weeks, between magazines. The survey is on the web as is the Graphpaper.PDF which has been surprisingly popular. Some of the other files will be there by the time you read this.

From: Pas - On behalf of The ACBRO Team Inc. Wishing success and prosperity for ESR. Regards, Pas ACBRO 26 -and- The ACBRO Team advises that it has a new location on the Internet. ACBRO's new URL is; www.acbro.org Please update your bookmarks. Thank You,Pas ACBRO 26

Thanks to Pas and ACBRO, The ESR team of writers appreciate your support.

From Jason - G'day Bob and thank you for releasing ESR. I was crushed when I went to the newsagent to buy "Radio & Communications" to find that the newsagent owner told me that the magazine was no more.

I saw ESR and bought it straight away and now I feel complete again.

Well I'd like to ask you something Bob, is it possible for you to to add a centre-fold? What do I mean you ask? Well a poster of Course, you know like truckin' life but of an amateur radio!! Think about it Bob, I know I'd like a centrefold of a lovely colourful Icom IC-790 or even a newly released Yaesu FT1000MP mark-V!!

Well I wish to say that I'm an active 27MHz DXer and the truth of the matter is, the band is more active than you've been told.

35lsb (27.335MHz -ed) is always packed with New Zealand, Indonesia, Soloman Island, Italy, America, Tasmania, Queensland, everywhere!!

Good old Kiwi6, for his S9+ and Squid from Melbourne, S9+ and the States, S9+ from KKK rock my PC-122XL constantly.

Everyday is not the same, different states and countries but I'll say this though, 27MHz is alive and will never die. The crew from Sydney NSW always rock my speaker and even Darwin rock the Li'l Red Leds on my plastic radio.

Thankyou for reading this letter, I hope in future your magazine will shed the light on CB for what it is, linears and over crowded DXers.

Love the magazine. I'll never stop buying it and always add to the pile that I've got (too many to mention) CB Action, Amateur Radio Action, CQ, Radio & Communications, and now ESR!!!

73s Bob, Keep up the good work. Don't ever give up, ever!!

Thank-you Jason, (notice that I did read your letter!) I am always pleased to receive compliments and encouragement as most people would be, but your added insights and suggestions are even more welcome.

I liked your idea of a centrefold, even though I was distracted by the thought of taking the photos myself, -purely as a leisure time activity, until I read that you wanted photos of Radio Gear. Oh well that would be nice as well. I'll give it some thought, and I suspect the agents may be happy to provide the photos.

ESR is for CB as well as AR, and though I often find the band dead, as some other bands are, I still find an interesting collection of DX on the bands at times. I often do begin at 27.335MHz and listen to see what's happening and who's out there. Note that I rarely put out a call, though I may make the occasional comment.

I intend to have a lot more CB items in the mag, which hopefully will be of interest to Amateurs as well, and I encourage all CBers to read up on the Amateur side of things and perhaps consider becoming an amateur now that the Morse Code stumbling block is about to be removed. Amateur radio is a natural next step from CB.

From: Ron VK3TRC - (Abridged) Asks if ESR intends producing an article on a Noise Bridge and/or a 70cm/2m Diplexer. Needs Trimmer Caps.

I will remind Ron on the Noise bridge which he and I have already discussed for a near future issue.

I have made a couple myself but now use an antenna analyser that goes up to 2m. Still it is an easy and cheap solution, and a great way to really learn the theory about how and why it works. There are some other test items in the pipeline as well.

I have some circuits for diplexers and agree that tunable trimmer capacitors are becoming difficult to obtain. When they are available they're often the wrong type or value. Perhaps there's something we can come up with to help?

From: VK2ZCZ - From the survey responses... You can't seem to get the crossword's clues to line up with the spaces. (September issue was a particularly poor example.)

Oops! I hadn't proofed the last two crosswords I had created as all the previous ones were, I believed, perfect. So firstly, I apologise, I will fully proof every crossword every issue from here on. Secondly, I'll go over the previous crosswords and correct any errors. Thirdly I agree with another suggestion given to me by an amateur at the Sunshine Coast SunFest at Wombye last weekend. I'll place all the crosswords on the website on a page of their own for you to download as you want. Hopefully that page will be in place when this issue hits the streets.

From: Athol Manning VK7LR - ...the only criticism being that the paper is "too good" ... The pages are too shiny, and slightly cream in colour thus reducing contrast, and so being very difficult to read with 87 year old eyes! ... I noticed an increase in the use of acronyms ...eg USB, Upper Side Band or Universal Serial Buss?

I have received several comments about the paper being too shiny and I have raised it with the printer hoping to get a nice balance between photographic quality and reading comfort. This issue is to be printed on a Matt paper which I hope will be a better all round choice.

Acronyms are a blessing or a nuisance and their use constantly swings between too much and too verbose, so we try to maintain a middle ground. Mostly however, it seems that the rate of the swing is reduced making the target more difficult to spot! We'll try to keep them at bay.

From: Damien VK3RX - Please consider archiving to CD a previous years editions, and offering the CD for sale. ... In future issues, dump the old classified advertisements and start afresh. Run them like the original R&C, AR Hamads etc. where an ad only runs for a single issue and then is dropped, and it is up to the individual to resubmit if he/she wants it to run again...

We had aready considered producing a CD, perhaps by prior order, at the end of each volume. The CD could contain all of the issues for one year as PDF files, suitable as an archival resource. I imagine that any software from that year might be included. as well.

As for the Web site, we couldn't place whole issues there anyway as the download capacity would be busted!!!

The classifieds are a problem as placing them can take a lot of time. Leaving them in place is easier than redoing the list every month, and some are meant to go on forever anyhow.

However when a buyer calls for an item to learn that it was sold a very long time ago, it is naturally frustrating. We do receive polite requests to remove the adverts for items which have been sold, but occasionally receive terse demands from buyers, that we remove an item because they had wasted their time.

We cannot know to remove an item unless we are told, but we would like to avoid having to re-create the whole section every month. At present one potential means is to create a classified database, online, which advertisers can access to place, review or remove their own advertisements. Commercial software is available of which, I have some sample copies to review.

From: verbal feedback from Amateurs, CBers and others who have spoken with me either in person or by phone. (Note these are my memories of what was said so if my poor old brain has skipped the groove again, remind me of the full argument.

–Why don't we have an all Amateur Radio magazine?

Simple, there are not enough amateurs to allow a sufficient growth in Australia.

–Why don't we have an all CB magazine?

Ditto above, let's face it, in Australia there are not enough of us to specialise as once was the case. I could go on and make the same comment about other radio areas who have already come to expect that they have to share a magazine with others.

–What happened to the Scanner Content?

I don't know! I haven't been an ardent reader of frequency lists, ever. I am happy to provide help to scanner operators by reviewing equipment, or printing construction details of antennas and preamps. I am happy for a writer to do a column on scanning, and happy to direct readers to web based frequency lists, but there's not enough room in the mag to list endless frequencies for services who mostly prefer to remain unknown. My best advice is to complete the survey and to add a letter telling me exactly what you want. I am interested in learning about your hobby.

–Do I think it is appropriate to advertise radios capable of "out of band operation" -specifically on 26-30MHz?

Yes, as long as the radios are legally available in Australia, they can be advertised. The retailers service a market and that market would buy from overseas if necessary. The radios actually encourage operators to consider seeking an Amateur Radio licence and suitable encouragement from Amateurs would help this transition.

When I became an amateur I was surprised to find how many Amateurs already knew me from my CB operations, and how many voices I recognised from CB ranks. It's time the CB and Amateur ranks joined forces in preserving HF bandspace for private use for all time.

–Why don't the advertisers list prices anymore?

Well a part of it is the fault of previous magazines not coming out on time. Advertisers have to plan ahead with their prices so they're not caught by fluctuating exchange rates. If the magazine is not out on time the specials may be out of date.

Also there is a tendancy for readers to push the prices down by approaching every advertiser with a challenge to beat the opposition. This is fine for buyers, except with such a small market, advertisers are already operating on low mark-ups compared with other consumer products.

Advertisers don't like to be caught with an advertised price that's just higher than another advertiser and agreed pricing is contrary to Australian Law so resellers of a particular make and model are not in a position to "fix the price".

Hopefully as the magazine proves it can be out in a reasonable timeframe, approximately 4-5weeks apart, the advertisers will return to giving you monthly prices. They may advertise the Recommended Retail Price (rrp) with a suggestion to call "for the best current price".

–I liked the old Rod Irving style adverts with large lists of items for sale.

So did I and I bought a lot from Rod Irving myself -what ever happened to him? Maybe some other advertisers will remember RI and consider a similar advertisement.

–Where can I get Radio Parts such as Variable Capacitors and Roller Inductors?

I hope that retailers with these items are reading this, and consider taking up a space, I certainly would like to see these items, once commonly available, advertised in ESR.

Sorry to indulge myself with these verbal feedback items, but sometimes I know that the passing comments are indeed very important.

Cheers from Bob VK4KNH

DC to Daylight

by John Batty VK4MBK
caradoc@caradoc.com

Welcome to my first article in ESR, the new flagship in Australasian hobby communications! You may remember my previous articles in other radio magazines; if so, you will know that I spend my time looking for the more unusual signals between DC and daylight, and digging up some of the curious and less-known ancient radio history. Since I have discovered that I am not alone in this weirdness, I have accepted the kind offer of our editor to continue in the same vein.

This first article is a brief outline of just some of the unusual kinds of signals which can be received, and some internet links into the online communities serving those topics. In subsequent articles, I'll report some of the more unusual catches in these and other areas, keep up to date with the various scenes and explore the science and radio weirdness envelope.

As foreshadowed in my article "Attack on America" back in the October/ November 2001 issue of Radiomag, the military comms side of the monitoring hobby has undergone some changes since the declaration of the "War on Terror".

Military monitors usually fall into two general types. One of these takes their mobile/hand-held scanner to nearby airports, air bases and military establishments and scans the bands while watching aircraft and ship arrivals and departures; the other generally monitors from home, hooked into a network of live internet mailing lists and chat rooms. Both types compile callsign and frequency lists, and a majority have a technical or nostalgic interest in the aircraft types, ships and units, as a large number of military monitors around the world are ex-military.

Thanks to the internet, it is usually possible to form a "daily mental picture" of major aircraft and ship movements around the world. A monitor at an English airbase would report the eyeballed departure of two KC-135 tankers, their callsigns and frequency; a monitor in Spain would report the same details of a flight of B-1 bombers, and later that day a monitor in Germany would report hearing all the aircraft together during the refuelling operation over Holland. A monitor in California may report the departure from San Diego of USS Abe Lincoln, and the next day someone in Washington State reports her Air Wing active off the coast, again with frequencies and callsigns.

Immediately after September 11th, 2001, most of these overseas mailing lists voluntarily began self-policing. With Combat Air Patrol flights orbiting most large American cities, U.S. monitors stated online that they would not be posting CAP information in their daily logs, and with B-52 bomber strikes against Afghanistan and Iraq taking off from Britain, UK monitors instituted an "after-mission only" reporting policy, with postings of radio intercepts from known combat missions delayed until all aircraft were home. Likewise, Pacific and Indian Ocean area intercepts of U.S. B-1B, B-52H and assorted support tankers, as they crossed to our north on their way to Diego Garcia and Afghanistan, were not reported "real-time" by Australian and New Zealand monitors. Of course, the usual crop of training, transport and transit comms are still reported on the usual active shortwave frequencies; try these for starters.

U.S. Scope Command Global Communications:

4724kHz, 6739kHz, 8992kHz, 11175kHz, 13200kHz, 15016kHz

RAAF Air Operations Communications System (AOCS)

General Purpose Net (GPN):
Day (2100-0900 UTC), USB
8974kHz, 11235kHz, 13206kHz
Night (0900-2100 UTC), USB
3032kHz, 5687kHz, 8974kHz

On the ground, things have also changed, or are in the process of changing. In days gone by (sigh .. the "good ol' days"), a hand-held scanner was a vital piece of equipment to have along on any visit to an airport, air show or major sea port. Half the population of any airport observation deck or air show viewers area was geeks, sprouting little antennae, with earpieces and cameras, cryptically muttering "Yes, that's Wombat 69 at three o'clock, wheels down on final" from under their telephoto lenses.

Most, if not all, air shows in the U.S.A and Europe now conduct gate searches on entry, so, if you have a scanner with you, it will be found. So far, it seems that something like half the air shows in the U.S. at any one time ban scanners, and half don't. It seems to be a local-area or base commander's decision, with no firm policy as yet. There is also much tighter perimeter security around all military installations; this is being reported everywhere.

U.S. monitors situated at long-standing public viewing areas, outside the perimeter fences of bases in the U.S., attract the attention of the local constabulary and military police. A monitor in Germany reported that as he sat watching and listening to arrivals and departures at a German base, from a car park outside the perimeter fence, he was approached by German military and civilian police and moved on.

It's not just in the U.S. and Europe. When Australian and Fijian troops and police were sent to the Solomon Islands, a monitor in Honiara contacted me with several intercepts and eyeball reports of their arrival by air and amphibious landing. Around the third day, he sent the following email; "Well, I got a talking to from the boys in green. I was near the tower at the airport listening to the tower frequency, when the guys in the tower came out and had a good look at me. They did this two or three times. Then one came out of the tower, snuck around the corner and took a picture of me. Then there were two other guys in uniform on the apron (there was a Herc unloading at the time ... engines running), who were talking with each other and then looking over at me. Eventually one came over to the fence, and asked to know what I was doing. I said "Just listening to the tower frequency." He said that I was making them all feel uncomfortable, as they are under a level of threat." Deciding that discretion was the better part of valour, he continued his listening at home.

That's what it all comes down to really - discretion. ***Remember, these soldiers, sailors and airmen are our family.*** Most of us know someone with a family member in the Forces and on deployment somewhere. If you happen to find a nice juicy military monitoring situation, show a little discretion how you go about it, think about who you tell and when, and don't make the job of our troops any harder.

An interesting parallel was written into a recent episode of "Spooks", the BBC drama about MI5 currently showing on the ABC. A hush-hush visit of President Bush to the UK was in progress. As Air Force One entered British airspace, the "Spooks" went into damage control because a radio monitor (described in the show as a "spotty little man with a radio") had picked up on AF1's callsign, and splashed it's imminent arrival at a specific base over the internet.

Our hobby is being written into television drama, folks; let's see if we can inspire some positive story lines, instead of being written in as part of the threat scenario.

The current world situation offers some unusual treats to the shortwave listener. During the fighting in Afghanistan and Iraq, the 193rd Special Operations Wing has been very active with their "Commando Solo II" EC-130E airborne broadcasting aircraft. These flying radio and television studios orbit at altitude above the target country, broadcasting radio and television programming.

This is one U.S. Air Force unit which is happy to see itself as a catch for the shortwave listener. "Ham radio operators can listen to the broadcast at 8700 kilohertz, said 1st Lt. Edward Shank, a spokesman for the squadron", in an article on the Air Force Link website ("U.S. Commando Solo II takes over Afghan airwaves", by Jim Garamone, American Forces Press Service.)

Programming is usually music, news and information in the various languages of the country. The following Commando Solo frequencies have been logged as active in the past;

100.4 MHz FM
693 KHz AM
8756 kHz AM
9715 kHz AM
11292 kHz AM

The first two frequencies, of course, you'd only hear if you were in the area of operations.

The 193rd Special Operations Wing is a Pennsylvania Air National Guard unit, based at Harrisburg International Airport, Harrisburg, Pennsylvania, U.S.A. - if you hear their broadcasts, try sending a detailed reception report, addressed to the Commanding Officer. Many military units will reply with a confirmation of some kind.

Another unusual catch over the last few months has been the British Forces Broadcasting Service. My first logging reads "BFBS in the Gulf came on air at 0300z on 15795kHz, news then into music. Poor copy here in Queensland at the moment but recognisable. Tx should be parallelled on 7260kHz, shifting to 11975/15795 at 0400z till 0600z."

The next day I wrote 'BFBS put a beautiful signal into Queensland all day today on 15795, until close of that frequency at 0700z. A friend in Victoria reported listening to them "15425 at 0641 with strong signal and clear audio ...".

From my listening today I figured out where I heard the frequent B.F.P.O. reference in yesterdays comparatively poor signal; occasionally the announcer will mention different B.F.P.O. addresses in his chat between record dedications to and from individual Service personnel (of the "this is to Lance-Corporal Dennis Jones of the Black Watch, from your girlfriend Donna; Dennis, she says the kids miss ya and come home soon" type). Very touching, light-hearted, always a positive slant, must be a great morale-booster for the troops. BBC and local (i.e. Gulf area) news feeds, sections of programming taken from domestic UK BBC Radio One and Two.

If you can catch them while they're on shortwave, it's entertaining programming. There is also apparently a BFBS Television Service operating for the troops in the Gulf, with UK domestic TV programming, which was listed in the "TV Guide" given on shortwave throughout the day. Amusing to hear the announcer giving the starting times for Coronation Street, and local weather forecasts, including the groans at 36°C temperatures and sandstorms."

Monitors in Western Australia now also have a better chance of catching comms traffic from U.S. Navy ships and aircraft, thanks to the more frequent visits for crew change, R&R and dockyard servicing.

Three excellent mailing lists to join for a daily overview of what's being heard around the world in the military comms scene are;

Milcom and WUN; join both these lists at www.qth.net. Milcom is military comms on HF, VHF and UHF, focussed on the U.S.A., but with members all over the world. WUN is the World Utility Network, which focusses primarily on HF utility and broadcast loggings, military intercepts are also well covered.

Reach_Hunters@yahoogroups.com
This is a superb mailing list covering military air movements across Europe, with input from the rest of the world.

SO, WHAT ELSE HAS BEEN HAPPENING ON SHORTWAVE?

Pirate ("Free Radio") broadcasts are still a fairly frequent, and always interesting, catch, usually offering good QSL booty. I recently caught a broadcast of Undercover Radio being relayed via the transmitter of another popular pirate, KIPM. I sent an email reception report to Undercover Radio, and ten days later received in the mail two glossy colour QSL cards, three audio, studio-quality show CD's and an information sheet.

Other pirates who are frequently heard in Australia and New Zealand are Alfa Lima International and Sensation AM, broadcasting music shows and listener contacts from Holland; Borderhunter, from Belgium, KIPM, Rock-It Radio and Mystery Science Radio from the U.S.A. Often, stations such as KIPM and Alfa Lima International will relay the programming of other stations, such as WAIR (All-Indie Radio), Radio Geronimo or Take It Easy Radio (these "relays" count for a QSL from the relayed station, since some of them never transmit their own programming!).

If you want to listen for pirates, the best time in Australia is late Sunday afternoons. This works out well because it is Saturday night/Sunday morning in the U.S. and Europe, when their pirates are most active, and it's also a good propagation time for the most-used frequencies. Holidays such as Halloween, Labor Day, Independence Day, Bastille Day etc are also worth checking the bands for special pirate"commemoration" shows (remember to allow for the time zone difference!).

U.S. Pirates operate mainly between 6900 and 6955kHz, particularly 6925, 6950 and 6955kHz, AM and USB. The Europeans are more scattered - Alfa Lima International "lives" on 15070kHz; Sensation AM is usually around 15725 to 15975kHz. If Borderhunter comes up, he's usually on 15795kHz. All of the stations mentioned have QSL'd 100%; reporting details are in the broadcasts.

For the net-connected, your best link-up with the online Free Radio world would be to join the following two groups; The first is the Free Radio Network, at:-

www.frn.net (parental guidance reommended on this one, due to sometimes

"inclement language" posted by some members).

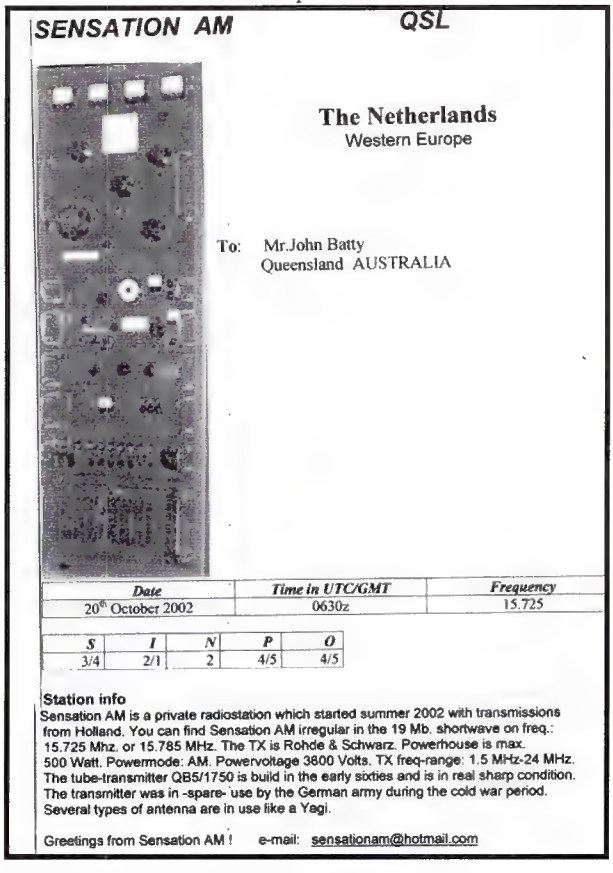
When there, scroll down the left side of the page to "FRN Hosted sites - the A*C*E*". Follow that link to the Association of Clandestine Enthusiasts loggings page. There you will be able to read the near-real-time reports of pirate reception around the world and, once you join (free), post your own logs.

The second link is the SWpirates@yahoogroups.com mailing list. This is a newsletter run by Alfred, the operator at Alfa Lima International, containing news and transmission-time tips focussed on Europe. Holland is going through a wave of pirate station raids at the time of writing.

There's more weird stuff on your scanner too, especially if you have a decent base antenna, and even more so if you're in a quite RF area and have a VHF/UHF pre-amp. Set your scanner searching between 30MHz and 87.5MHz. If the skip's in, you'll find lots of FM comms from U.S. Army and Marine Corps range training facilities, small-town Fire, Police and Ambulance services aross the U.S.A., Spanish-speaking taxi services in the U.S.A and South America, and South Korean theatre U.S. Army comms, and other unusual signals, all floating in and out on the skip. If you're internet-connected, I can't recommend a better VHF skip connection than joining the VHF Skip discussion group at Yahoogroups. To subscribe, send an email to vhfskip-subscribe@yahoogroups.com.

If you have a spare scan bank, set it to scan between 261.450 and 261.950MHz FM, with a step of 25kHz. This is the bandplan for the PacWest Bravo satellite. Many of the channels frequently carry data, but occasionally various channels will carry voice activity. From around the end of September, look out for the yearly summer Operation Deepfreeze communications on these satellite channels and HF aeronautical frequencies, as C-5, C-141 and C-130 aircraft resupply McMurdo and other bases in Antarctica.

That's enough from the "less-mainstream" side of radio for this month. Be sure to follow up next month.



SENSATION AM **QSL**

The Netherlands
Western Europe

To: Mr.John Batty
Queensland AUSTRALIA

Date	Time in UTC/GMT	Frequency
20th October 2002	0630z	15.725

S	I	N	P	O
3/4	2/1	2	4/5	4/5

Station info
Sensation AM is a private radiostation which started summer 2002 with transmissions from Holland. You can find Sensation AM irregular in the 19 Mb. shortwave on freq.: 15.725 Mhz. or 15.785 MHz. The TX is Rohde & Schwarz. Powerhouse is max. 500 Watt. Powermode: AM. Powervoltage 3800 Volts. TX freq-range: 1.5 MHz-24 MHz. The tube-transmitter QB5/1750 is build in the early sixties and is in real sharp condition. The transmitter was in -spare- use by the German army during the cold war period. Several types of antenna are in use like a Yagi.

Greetings from Sensation AM ! e-mail: sensationam@hotmail.com

Please send your monitoring catches to me at:-
caradoc@caradoc.com -or-
P.O. Box 703, Nanango, Qld 4615, and I'll write them up.
Keep twiddling the knobs, folks!

Scanning the V8 SUPERCAR 1000

courtesy of davidkc@hotkey.net.au

The time has come again for the V8 Supercar 1000 in Bathurst. This list is of frequencies found at Mount Panorama during monitoring of radio bands from 158 Mhz to 520 Mhz in previous years. Race control this year may be in 162 - 164 Mhz area due to conflicts and interference from UHF radios in previous years. To make things easier when searching for that hard to find frequency remember taht Race Control and many others do a full communications check with all points 15-20 minutes before the race or practice session. Have scanners in tow with your search limits ready. Last year many different areas of the radio spectrum were used. Race Control were found at 466mhz, 505, 499 and so on. It may help to enter all known freq into the scanner to see what may be active. Good luck with what you find. I would appreciate if you email to me any frequencies found so the list can be kept up to date for all to see.

162.335 - Race Control - Sector Control (Main Centre) Vhf Channel 1
163.8375 - Race Control - Sector Control - Flag Marshals
163.5375 - Race Control - Fire Chief Vhf Channel 3
162.8625 - Race Control - Rescue Vehicles Vhf Channel 4
492.300 - Race Control - Medics Uhf Channel 1
492.425 - Race Control - Medical Cars, Victor And Alpha Cars.
505.825 - Race Control - Security
491.775 - Race Control - Scrutineering
497.800 - Race Control - Timing, Pit Lane, Link With 492.600 Uhf Channel 3
The layout of VHF anc UHF channels on event staff portables are as follows :
Ch 1 VHF - Race Control - Sector, Course Car, Safety Car, Pit Lane, Starters.
Ch 2 VHF - Race Control - Flag Marshals, (not used, on hard wired loop).
Ch 3 VHF - Race Control - Fire Marshals, pumpers.
Ch 4 VHF - Race Control - Rescue, Recovery. Tow trucks.
Ch 5 VHF - Race Control - Scrutineering, (only have UHF channel so far).
Ch 6 VHF - Race Control - Backup to CH 1
Ch 7 VHF - Race Control - Backup to CH 2
Ch 1 UHF - Race Control - Medical Centre, alpha & victor cars, Doctor.
Ch 2 UHF - Race Control - Spectator Control (unable to locate at this stage)
Ch 3 UHF - Race Control - Timing
467.075 - talk heard asking people to check toilets, also clean bins. Guy heard swearing on radio, was asked to stop swearing or fine of $1500 would occurr.
472.025 - asking to get generator and other equipment (was listed as a TV Channel 9 freq).
492.275 - unsure of user, thought was Race Control.
472.075 - asking for housing of lipstick cameras - (Global TV)
489.700 - catering channel
509.925 - Audio - setting up TV equipment
470.675 - ?
484.925 - Audio,Music
509.550 - Audio, possible TV
519.600 - Testing radio
494.925 - talking about parking semi-trailers, unloading cars, parking
477.475 - Setting up TV equipment
492.000 - TALKING ABOUT REID & SULMAN PARK
498.875 - Sound checks (Very active, TV Channel)
498.300 ,498.500 ??
471.800 - testing radios (9pm, 2/10)
491.600 - Ticketing, accreditation (3/10) Security
493.475 - Camera 14 talking to top of Mt Panorama (3/10)
505.2125 - Possible Scrutineering, (Merchandising?)media Shuttle.
476.650, 476.900 ??
493.500 - electricians talking about generators positions
465.625, 505.085, 498.175, 472.150, 471.975, 492.565??
469.700 - link with 491.100 , Scrutineering
471.450 - timing monitors
491.075 - ?
495.025 - Team freq from GTP practice 9.15am 04.10.
469.850 - Team freq from GTP practice 9.15am 04.10 (also listed as Dean Canto's Car 45)
519.750 - Team freq from GTP practice 9.15am 04.10
471.675 - Team freq from GTP practice 9.15am 04.10
470.375 - talking about stickers on V8 Brutes, time that marshalling area is open. Mike Dennis name mentioned. also talk about correct stickers and id on helmets, John Bowe & Chris Dunn.
505.525 - operations, TV
490.900
492.075
493.900 - COMMENTARY

NOTE: Under no circumstances try to communicate with any of these frequencies as to do so could result in prosecution, or infringe the safety of the event. (-ed)

Gold Coast Amateur Radio Society

Incorporated

Affiliated with the Wireless Institute of Australia

Gold Coast HAMFEST

November 8th 2003

Radio, Electronics, Computers, CB's etc

Looking to dispose of surplus equipment?
Looking to buy surplus equipment?
Looking to catch up with old friends?

The Gold Coast Amateur Radio Society Inc. will hold its Annual Ham Festival on Saturday 8th November 2003.
The venue for this 26th HAM Festival is again the
Albert Waterways Community Centre
corner of Hooker and Sunshine Blvds, Broadbeach,
directly behind Pacific Fair Shopping complex! (Partners NOTE!)
The Gold Coast Amateur Radio Society Inc. invites you to participate in this event by displaying for sale your pre-loved goods and equipment.

Exhibits can be set up from 7:30 am
Doors will open to the public at 9 am
Saturday 8th November 2003.

The charge to exhibitors is $15 prepaid or $20 pay-on-the-day per table, which includes chairs, and 240V AC power on request.
Multiple tables must be prepaid.
Car-boot sale places are available outside for $10 prepaid or $12 on the day.
If you wish to reserve a table or tables, please complete an Exhibitors Application Form available from the website and return it with your remittance before October 17th

To Secretary, GCARS!
PO Box 588, Southport Qld 4215

Any enquiries please contact Susan or Bob Tomkins on (07) 5545 0955
Email: secretary@goldcoastamateurradio.com

Radio, Electronics, Computers, CB's etc

26th Gold Coast HAMFest

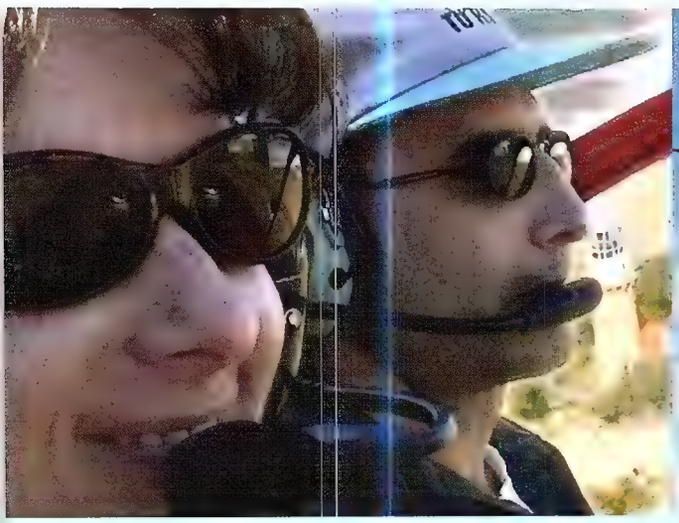
COME AND ENJOY A WEEKEND ON QUEENSLAND'S RENOWNED GOLD COAST - VERY RELAXING!

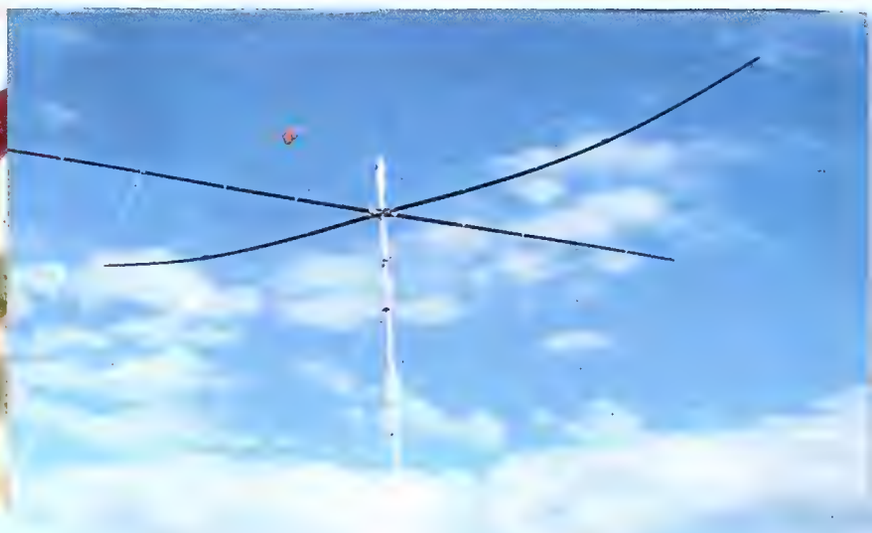
Lighthouses On The Air

- a Manly-Warringah Radio Society Weekend

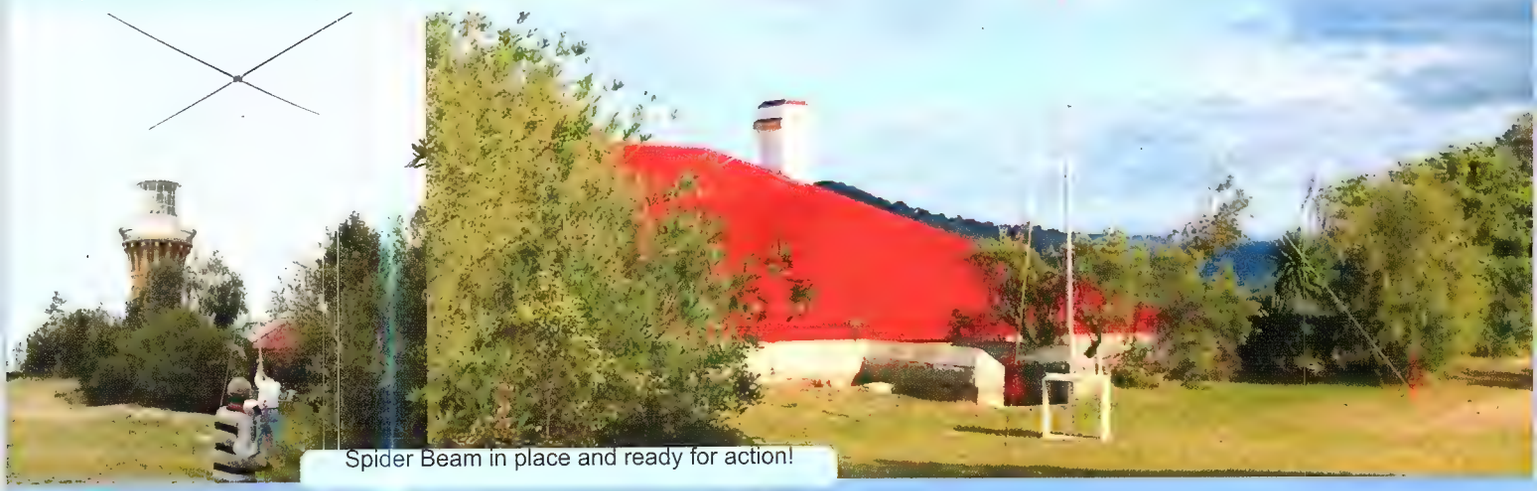
a photo journal from
Richard Murnane VK2SKY

Members of the Manly-Warringah Radio Society set up a Spiderbeam tribander on Barrenjoey Headland at Palm Beach, north of Sydney. Barrenjoey Lighthouse of course in the background.





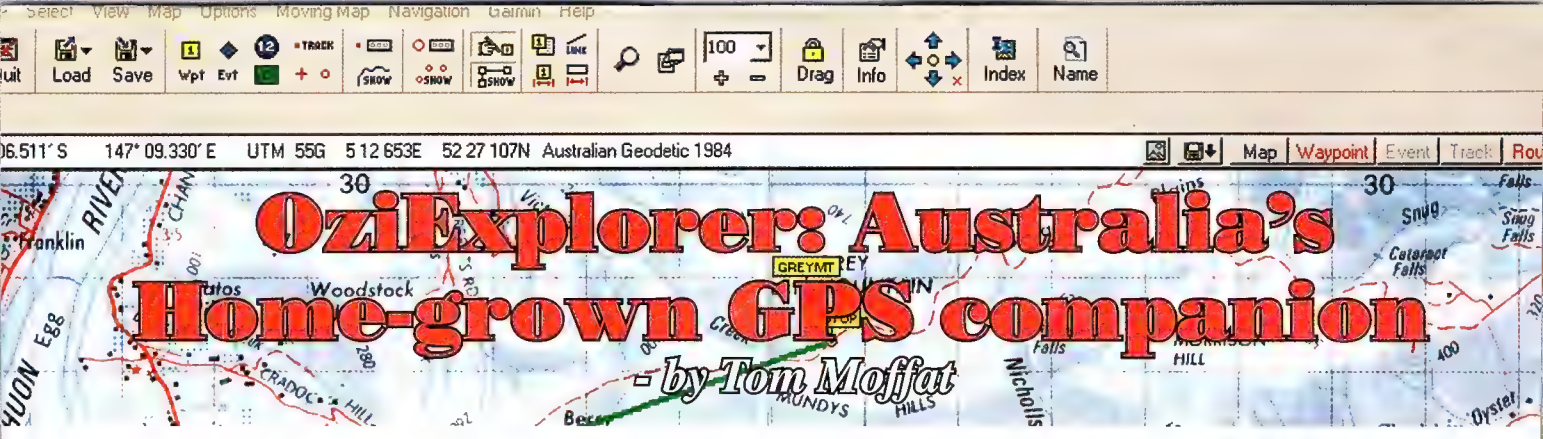
Connie VK2CON and Yves VK2AUJ (pilot) at the controls of a Bell 47 (M*A*S*H-style) helicopter for flypast QSO with VK2MB



Spider Beam in place and ready for action!

Bernd VK2IA demonstrates the big advantage of CW - he can carry on a 30wpm conversation with one hand while eating lunch with the other!

Peter VK2IT operating VK2MB/p


Select View Map Options Moving Map Navigation Garmin Help
Load Save Wpt Evt Drag Info Index Name
06.511' S 147° 09.330' E UTM 55G 512 653E 5227 107N Australian Geodetic 1984
Map Waypoint Event Track
OziExplorer: Australia's
Home-grown GPS companion
- by Tom Moffat

It's a fact of life that radio enthusiasts are branching out into other areas of the latest technology, mostly computerized gadgets that wouldn't have been imagined a generation ago. Who would have thought of such things as computer-controlled car engines, and digital cameras with no film? But by far the most advanced development, from a sheer cleverness point of view, is personal GPS navigation that's appearing in cars, airplanes, boats, and backpacks, all over the world.

GPS has evolved from ancient radio navigation systems such as Loran, through early satellite systems like Transit, and into the Global Positioning System we have today - the domain of the United States military. But from the very beginning, GPS has been available for civilian uses too.

A constellation of orbiting satellites provides ultra-precise position information to ships at sea, aircraft, and even surveyors on the ground.

Nowadays cars are coming out of the factory with standard-equipment GPS which can talk the driver turn by turn to a desired destination. And last but not least - bushwalkers now have access to cheap hand-held GPS receivers that can measure their position down to five metres or so.

These GPS devices can operate nicely on their own, leading their owners to mountaintops or beaches, and making a visual record of their adventure, footstep by footstep. But GPS really shines when teamed up with a personal computer. It becomes a total trip-planning and navigation system, while allowing users to relive their more intrepid expeditions while sitting in front of the screen.

The computer software is primarily concerned with mapping, and using maps to carefully examine terrain and plan the most practical way to get from here to there without getting lost. There are many options on the market.

My first experience, while living in the USA, was with a package called MapTech Terrain Navigator. Early versions of this software, aimed primarily at bushwalkers, were called "Take a Hike".

There were about six of them, each covering one popular national park. At this time I was living on the Olympic Peninsula near Seattle, an area about the size of Tasmania.

One of the Take-a-Hikes was centred on the Olympic National Park, and coverage spilled over to nearby cities and towns, including a large part of the city of Seattle as well as my own home, Port Townsend.

Take-a-hike came on one CD containing Terrain Navigator along with over 100 topographic maps in 1:100,000 and 1:25,000 scales. And the price for the whole works: $US 30. When I moved back to Tassie about a year ago I wanted to bring my Terrain Navigator with me, but there was no facility to add Australian maps. In fact you couldn't use any maps other than the ones that came on the MapTech CD.

So I refrained from computer-aided bushwalking for awhile, hoping MapTech would release a Tassie version with maps on a CD. Every now and then I'd e-mail them and ask if they'd changed their mind about Australian coverage, but they said it wouldn't be practical. About three weeks ago MapTech released a new version of Terrain Navigator, so I decided to ask about Australia one more time. An e-mail came back: No, nothing at this stage.

Non-computer trip planning means poring over a paper topographic map, taking note of recognizable features along the journey, and using the map's grid markings to manually enter coordinates into the GPS memory. This is somewhat slow and tedious, especially when you are accustomed to going click-click-click on the computer and the job's done. By now I had a decent collection of the excellent TASMAP series of topographic maps, and I knew from following internet newsgroups that the locally made OziExplorer could handle just about any kind of maps, including those converted into digital images by a flat-bed scanner. So I bought a nice new Canon scanner (good excuse, huh?) and ordered OziExplorer.

Before launching straight into the software, it's useful to know about the types of data handled by an average GPS receiver. Its most basic function is to determine its (your) position, with good accuracy, anywhere on the surface of the earth, and the air above it for that matter. The distance above sea level, the altitude, is also calculated. The GPS also has a highly accurate time-of-day clock. All these values are derived from satellites and displayed on the GPS screen.

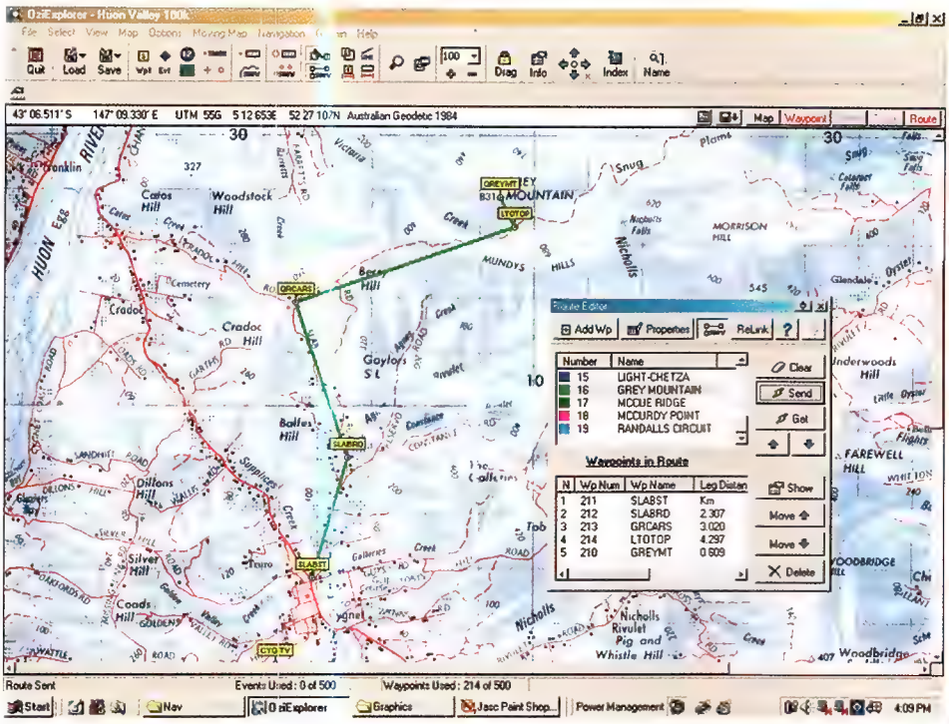
A new position measurement is taken every few seconds, and by measuring how far the GPS has moved from the last position, it's possible to calculate speed. A trail of successive fixes will also reveal the direction of travel. It's important to note that a GPS cannot figure out a direction if it's not moving. It is not a compass, although some up-market GPS receivers do include an electronic compass as part of the system.

For GPS navigation toward a known destination, the user must deal with three major data objects:

The WAYPOINT records the position of a familiar object such as a road junction, a big rock, or a mountain peak. If you are actually present at the proposed waypoint, you can press a button on the GPS and it will record that position along with an identifying waypoint name. If you are not present, but working from a map as mentioned above, you must enter coordinates manually. My own GPS receiver now contains 215 waypoints, collected during five years of trips over two continents. I seldom erase them□hey make good souvenirs. There is space for a further 2□5 waypoints.

The □OUTE is a list of waypoints that you must visit in sequence to navigate to your destination. This is usually accomplished by turning the screen of the GPS into a moving map display. The waypoints in the route are shown in their proper positions, joined by straight lines. You are supposed to walk along the lines from waypoint to waypoint, but in real life you will most likely encounter things like deadly snakes, leeches, impenetrable scrub, hundred-metre cliffs, and good old Tasmanian mud. So you must divert off the true route to get around these obstacles. Nevertheless, your next waypoint will remain in sight, either on the map screen or as an arrow that constantly points to the waypoint as you travel.

The true record of your stumblings along a route will be stored in GPS memory, as well as being displayed as a wiggly line on the map screen. This line is known as a T□AC□, and it will be continuously generated whenever the GPS is in motion. Note that it does not depend on a route being present. You can be happily travelling along and come across an interesting fire trail.



"I wonder where that goes", you say, and you charge off into the unknown. Should you become geographically embarrassed during this side trip, you need only follow your track on the GPS screen back to where you started.

So, from the user's point of view, waypoints and routes are INPUTS to the GPS, while tracks are OUTPUTS. This holds true for a computer as well.

The GPS Meets OziExplorer

OziExplorer is a program of many uses. You can study topographic maps, blown up to intimate detail, to find interesting mountains or rivers or beaches to visit. Or just a simple rock formation near your home. You can then use the computer mouse to mark a trail of waypoints toward where you want to go.

The map view is so detailed that you can figure out where the worst scrub is, or avoid cliffs by noting the spacing of contours on your map. The resulting route of waypoints can then be fed into your GPS, to be displayed on its screen as you progress along the line.

The map in **Figure 1** shows a computer-generated route from the small Tasmanian town of Cygnet to the lofty summit of Grey Mountain. The route is the green line, joining the little signposts which are the waypoints assigned to that route.

I entered them by looking for easily recognized features on the map and then clicking on the computer screen to spawn a new waypoint. The waypoints must be specified first, and then entered into a route (number 16) as shown in the Route Editor window to the right of the screen.

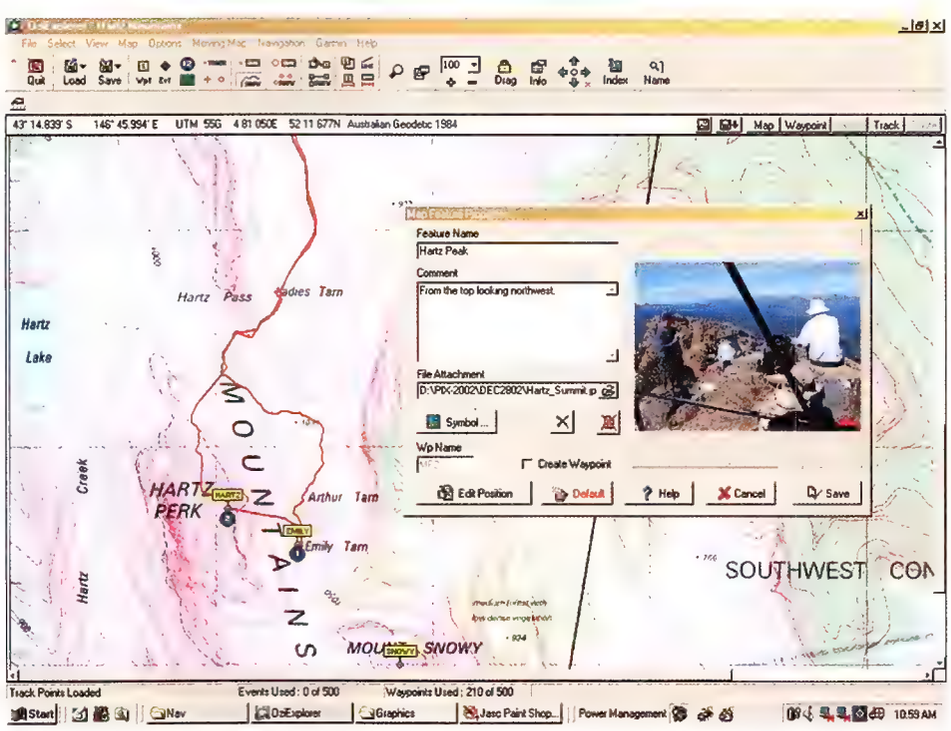
This route involves a bit of cheating, because it's intended to use a car to get as far as the waypoint "GRCARS" where there is a gate.

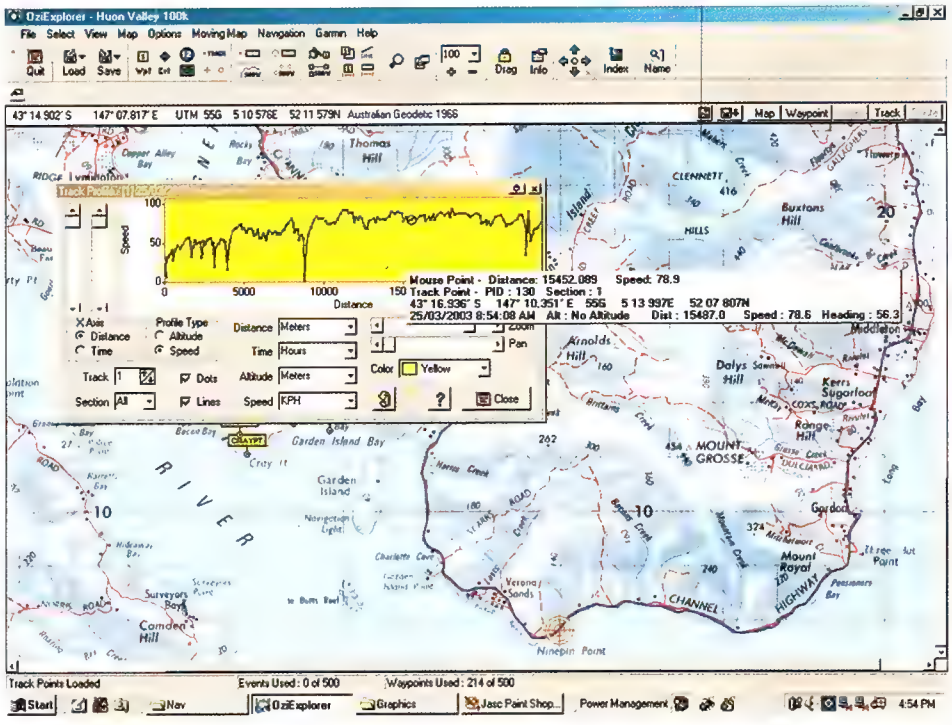
From here it's a straight-line walking distance of 4.297 Km to the next waypoint (see the Route Editor screen) and then a further 0.609 Km to the top. Most of the walking will be along what looks like a reasonable dirt road which roughly parallels the green line. I last climbed Grey Mountain about 12 years ago, and I think there is a track from the waypoint "LTOTOP" to the top. The location of that waypoint is somewhat of a guesstimate. Success may require a scrub-bash.

Now cast an eye upon **Figure 2**. Note the familiar shape of the route's line, reproduced in miniature on the GPS screen. It was loaded from the computer to the GPS over a serial connection.

When the journey to Grey Mountain begins, the image will be zoomed in so only a few hundred metres shows at a time, and then, as Johnny Cash says, we will "walk the line". As we progress, the GPS screen will show the distance to each waypoint as we head toward it. And as we arrive at the top, the GPS will beep in triumph, having reached the last waypoint in the route.

There is no track shown with the Grey Mountain route because the journey hasn't been attempted yet. However the map in **Figure 3** shows a track, the red line coming in from the top, which was recorded during a journey to Hartz Mountains National Park in southwest Tasmania.




OziExplorer - Huon Valley 100k
File Select View Map Options Moving Map Navigation Garmin Help
Mouse Point - Distance: 15452.089 Speed: 78.9
150 Track Point - PID : 130 Section : 1
43° 16.936' S 147° 10.351' E 555 5 13 997E 52 07 807N
25/03/2003 8:54:08 AM Alt : No Altitude Dist : 15487.0 Speed : 78.6 Heading : 56.3
Track Points Loaded
Events Used : 0 of 500
Waypoints Used : 214 of 500

No route was required for this walk because it followed a carefully marked and maintained walking track shown on one of the TASMAPs, as well as a special national park map produced by the Parks and Wildlife Service.

The trip was a large expedition of about a dozen members of the Hobart Walking Club, most of whom had been there before.

So we didn't really need the GPS, other than to keep track of the altitude climbed (puff, wheeze) and to display the distance remaining to Hartz Peak. (I just noticed: There is a typo on the map! It says "Hartz Perk"!)

There was one comforting safety feature: if the mountain suddenly became enclosed in cloud, as is very common in Tasmania, the GPS track would have led us right back to our cars.

The track also made a nice souvenir to later show off on the computer screen. On a topographic map, the contours indicate lines of constant elevation. The closer together the contours, the faster the elevation is changing - in other words, the steeper the hill.

After lunch at the top of Hartz Peak, the trip leaders decided it might be nice to visit Emily Tarn, a charming little lake in the valley below. But they decided not to bother with a track; instead we plunged right over the side of the mountain, scrapping and scrambling down what seemed a vertical cliff, holding on for dear life to scrubby little bushes.

By the time we got to the bottom I was leaking blood from all four appendages, totally sore and exhausted. I'll know better next time, or study the map more closely before taking "precipitous action". OziExplorer has a nice function I've never heard of elsewhere.

You can generate a "map feature" anywhere on any map to display a few notes about the location, and even a photograph you have taken there. On the Hartz Mountains map you'll see a blue circle near Hartz Peak, and another near Emily Tarn.

Clicking on one of these circles will produce a properties screen, complete with a small version of your photo. A click on the photo will make it fill the whole computer screen. The photo shown is the Hobart Walking Club party having lunch at the trig marker on Hartz Peak, 1254 metres above sea level. As well as map features, I've learned it's also possible to attach a photograph directly to a waypoint, which simplifies things somewhat if you don't want to include any notes.

In Ozi, tracks are more than just a pretty face. A track is simply a list of successive GPS position fixes. The track display you see on the screen is really a series of short lines joining the fixes. You can use Ozi's track editor to display each of the fixes as a tiny circle along the red line.

Another feature lets you create a "track profile" which is a total fix-by-fix dissection of your journey, displayed as a graph against distance or time. (See **Figure 4.**) The vertical axis can show your choice of speed or altitude. Unfortunately my Garmin GPS does not record altitude information as part of a track point, although many others do. So I couldn't try it out. Pity, it would have been fun to closely examine that near-vertical plunge down Hartz Peak.

The speed display, however works very nicely indeed. It is much like the graphs used by railways to constantly record the speed of a train.

The graph can be zoomed and panned to concentrate on any portion of a track log. When you click the mouse on one of the points on the graph, a bulls-eye appears on the track itself at the map location of the selected point (bottom of screen, near Ninepin Point).

A text line then displays your instantaneous position, heading, speed, and the time when the point was recorded. I was doing 78.9 Kph, well within the speed limit.

This raises an interesting possibility: GPS receivers are being used more and more in cars. I have an external magnabase GPS antenna that pops on the top of the car, and my handheld GPS can then help me follow a route to a destination, recording track log entries all the way.

What happens, then, if you get busted for speeding? Within your GPS you have extremely accurate evidence of the location of the alleged offense, the day and time as derived from a GPS satellite's clock, and - your speed at that instant. It should be possible to load your track into Ozi, use the speed profile feature to display the true speed at that instant, and print out a screen dump to show to the judge.

I asked a barrister friend about this, and it was his opinion that if your evidence showed an instantaneous speed below the limit, then you would most likely win the case hands-down. He said that speed cameras in particular are notoriously inaccurate, tracking the wrong car or getting bamboozled by things like metal water tanks.

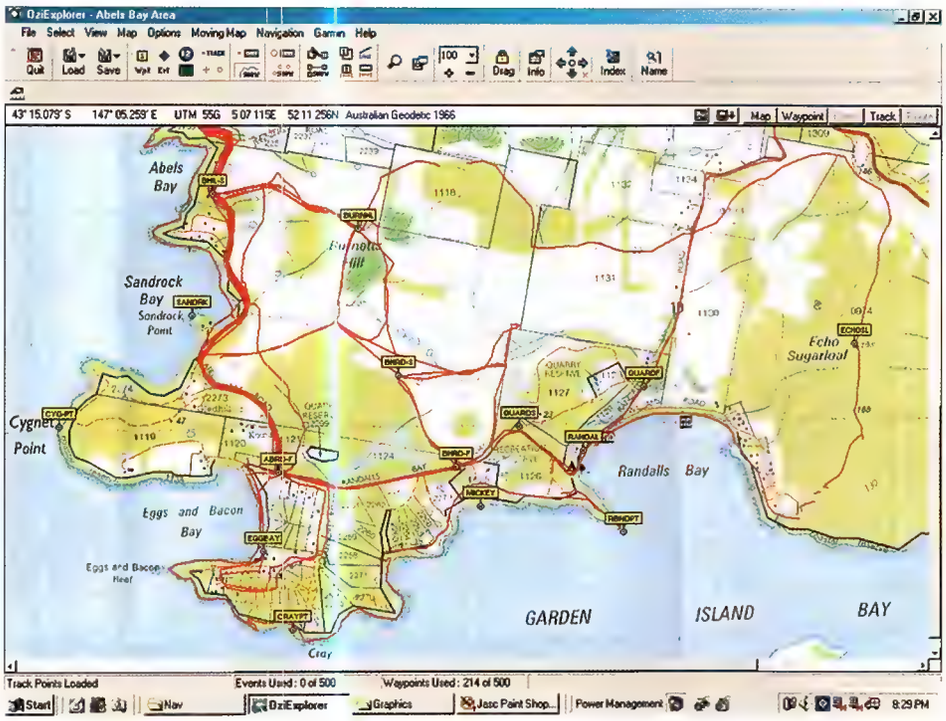
Well, it just happens that I live in an area where every home has a large water tank outside to collect rainwater - there is no reticulated water here. Any speed cameras, or any police radar for that matter, could be highly suspect. Maybe that's why there are few speed traps in our district. And lots of speeders...

All About Maps

Ozi's worst feature is also its best feature: It doesn't come with any maps. But the programs that do come with a selection of maps usually don't let you use maps that aren't in their format.

Ozi, on the other hand, lets you use maps, or drawings, or aerial photos, or satellite pictures, from just about any source. You can download these digital images from the internet - the American state of New Mexico offers every topo map in the state, on the net, for free. Same goes for the state of Nevada. Ozi would let you use these maps to plan a walking trip across Area 51 if you were that way inclined (it's called Groom Lake on the map).

There are several sources of digitized Australian maps, but from what I've seen, you have to pay for all of them. The Ozi web site, www.oziexplorer.com, has links to several digital map suppliers.



Some states offer maps on CD covering their entire area, but these don't come cheap. However the most useful maps are those you prepare yourself using a flat-bed scanner. It's YOUR choice which area, and how much area, each of your maps is going to cover. The process is a little fiddly, but the results are outstanding. If you're getting serious about digital bushwalking you'd better budget for a scanner in the near future. Mine cost $149 at Dick Smith's, and it produces wonderful results.

Flat-bed scanners offer a selection of scan densities, ranging from around 75 dots per inch (DPI) to 1200 DPI and higher. The higher the maximum DPI, the higher the cost. During my first attempts with a scanner, I though the higher the DPI, the better the quality. Not so. The higher the DPI, the more magnification of the original.

With 1200 DPI you can scan a tiny postage stamp and blow it up to full computer-screen size. But paper maps are as big as a folded-out newspaper, needing little or no magnification. So you don't really need a super-high resolution scanner unless you're into scanning postage stamps.

Conventional wisdom has it that 72 or 75 DPI should be used for any image that's going to appear on a computer screen. This, in theory, gives a life-size image, same scale as the paper-map original. I use a laptop computer with LCD screen, so 75 DPI looked rather yucky.

You can find an appropriate DPI setting by using a ruler and a calculator on your computer screen. The viewing area of my laptop screen is exactly 12 inches wide. The screen resolution is 1024x768 pixels.

So we have a pixel width of 1024, divided by the screen width of 12 inches. Thus, my screen has 85 DPI. If I scanned something at 85 DPI, the screen image would be the exact size of the real thing. But, looking for more quality, I decided to scan at 150 DPI which makes the screen image 1.8 times the size of the original. Much nicer to look at, and you can easily read the finest print on the maps.

To change map scales, I use paper maps of different scales - 1:25,000, 1:100,000, and 1:250,000. The scan density remains at 150 DPI for all. On a scanned 1:25,000 map, one kilometer displays as 70 mm on the laptop screen. **Figure 5** shows such a map in which everything on it is with walking distance of my home, ideal for leisurely two-hour walks. Ten individual tracks displayed at once show there has been a lot of activity, all streaming in from the upper left, from the house of Tom. Most of the terrain is hilly farm land, surrounded by beaches. Burnett Hill and Echo Sugarloaf are decent hills with impressive views.

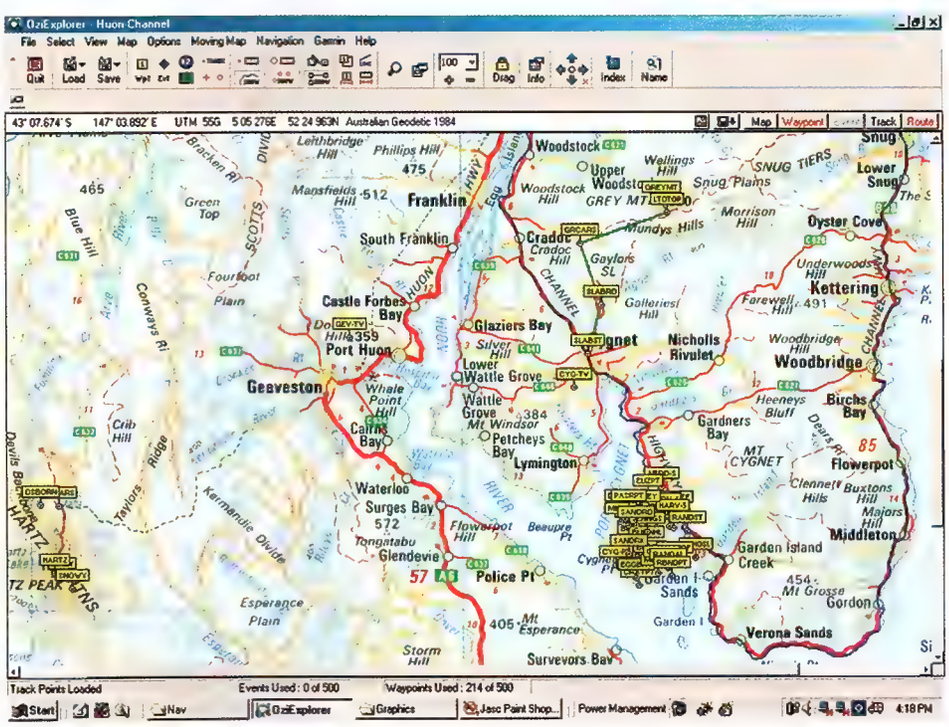
Figure 6 is a 1:250,000 map of Tasmania's Huon Valley showing an area ten times larger than the area in Figure 5. This scale is more suited for bicycle rides or car trips.

The blue line is a section of a track recorded during a 140 km car journey to Hobart and back. You can see the waypoints from Figure 5 all bunched up in the lower right area of Figure 6. A shrunken version of the Hartz Mountains bushwalk from Figure 3 is visible at the lower left of the screen.

Having read all this, you may already be in "must have" mode. You can download a demo version of OziExplorer from the internet (www.oziexplorer.com). Some features are disabled, and you must register the program to get full performance ($75, US, although Oziexplorer is Australian.

Of course you'll need a GPS too, and Ozi is compatible with just about every one on the market. Justification to Mrs: most electronic stuff, you sit around with. But for the GPS to do anything useful, it must be kept moving, ie, exercise for the lazy body.

You will soon become addicted to your GPS, and that is a good thing. Also, you'll need a flat-bed scanner to digitize all those family photos onto CD for safe keeping. (Oh, yeah, maps too!) Seriously though, there are certainly worse ways to spend your money!



A Little Portable with Stamina

from Neil Jeffries
VK2KYG

Take a hand held that's hungry on batteries, and add some more battery, then add an external antenna and a box to keep it all in. Now you need an external mike because it's simply too heavy to hold to your mouth. Seeing as you have the box, why not add some accessories, and tools, and well... maybe it needs some wheels -just kidding! No construction guide offered, just look at the pics! The antenna lead is connected to the antenna under the lid. It uses two 12volt Gel Cells in parallel for added capacity though 6volt Gel Cells in series might do the same job. The charger is in there as well. Oh, and the box...well... another story!

CQ-Contest

by Ian Godsil
VK3VP/VK3JS
contests@esr-mag.com

Greetings to all Readers.

Contesting can be very interesting, but it is not an activity that enjoys real popularity amongst Australian amateurs in general. To me, this is a shame, as one of the great benefits of entering contests is that you gain a valuable measure of how your station performs. This is quite apart from the level of drive that you may bring to the contest -- are you in it to win it or just to give a few numbers?

I am primarily an HF CW operator, but I always make an effort to support the VHF section of the annual Remembrance Day Contest. I put up antennae for 6/2/70 FM and even though I do not expect great distances, I never cease to be amazed at how far I can get on this occasion. Therefore, I not only know that I can be heard in various suburbs, but I am also giving numbers which help the scores of those who are interested in trying to win.

On HF this philosophy does not apply, as I set out to be the top VK3 scorer in the Open Section each year. Here is where I must go and chase contacts. This is time- and energy-consuming, but if you want to win it is the effort that must be made. Using a logger helps in both situations, but that's a story for another time.

From the above examples I know what sort of performance I can expect from my station. I know where I need to improve in my scoring rates and bands. (It does not follow that I necessarily do get much improvement next year, but at least I know!)

Against this background I commend to you all the OCEANIA DX CONTEST during the first and second weekends of October (see rules at http://www.vkham.com/contests). This is VK/ZL's great international contest, in which many DX stations look for contacts with our part of the world.

Contest Calendar October - December 2003

Oct 4/5	Oceania DX Contest (SSB)(Sep 03)
Oct 4/5	TARA PSK Rumble (Oct 03)
Oct 5	RSGB 21/28 MHz Contest (SSB)
Oct 11/12	Oceania DX Contest (CW) (Sep 03)
Oct 18/19	JARTS WW RTTY Contests
Oct 18/19	Worked ALl Germany Contest (CW/SSB)
Oct 19	RSGB 21/28 MHz Contest (CW)
Oct 25/26	CQ WW DX Contest (SSB)
Oct 25/26	CQ WW SWL Challenge
Nov 1/2	Spring VHF+ Field Day (CW/SSB/FM)(Oct 03)
Nov 3	High Speed Club Contests (CW)
Nov 2/3	Ukrainian Contest (CW/SSWB/RTTY)
Nov 9/10	OK/OM DX Contest (CW)
Nov 16/17	LZ DX COntest (CW)
Nov 23/24	CQ WW DX Contest (CW)
Nov 23/24	CQ WW SWL Challenge (CW)
Dec 5/7	ARRL 160 Metres Contest (CW)
Dec 6/7	MDXA PSK31 DeathMatch (PSK31)
Dec 6/7	TARA RTTY Sprint
Dec 13/14	ARRL 10 Metres Contest (CW/SSB)
Dec 20	OK DX RTTY Contest
Dec 20/21	International Naval Activity (CW/SSB)
Dec 26	Ross Hull Memorial VHF Contest (CW/SSB/FM) (Nov 03)(---to 11 January, 2004)
Dec 27/28	Original QRP Contest (CW)
Dec 27/28	Stew Perry 160 Metres Distance Challenge (CW)

Sadly, we do not enjoy a good reputation amongst the DX community for providing DX opportunities, nor for answering QSL cards. On this occasion, and when changes to the access to HF bands eventually come into force, why not make an effort to change this perception?

Everything requires effort. You cannot achieve satisfactory results if you expect things to come to you. Therefore, some effort in setting up as good a station as you can, some effort in using the shack computer to assist your contesting and some effort to seek contacts, will bring you satisfaction in achievement and the efficiency of your station.

Please also remember the VHF Field Day coming up next month. You may work in the field or at home for this one, so please have a look at the rules below.

Be challenged! Extend yourself! Take part in a contest!

73 and good contesting, Ian Godsil

Results CQ/RJ WW RTTY DX Contest 2002

VK/ZL only. Call\Category\Score)

ZL2AMI	SOABHP	1,174,057
ZL3JT	SOABLP	448,200
HS0/VK3DXI	„	29,250
VK5LA	SO15metres	29,841
VK6GOM	SOassisted	750,774

RULES SPRING VHF-UHF FIELD DAY 2003

from John Martin (VK3KWA), Contest Manager

1/2 November, 2003 0100UTC Sat. - 0100UTC Sun.

The Spring VHF-UHF Field Day will take place on the weekend of November 1 and 2, 2003. Logs will be due on November 24 and entrants are also invited to include any comments or suggestions about the rules.

Dates: Saturday and Sunday November 1 and 2, 2003.

Duration in all call areas other than VK6: 0100 UTC Saturday to 0100 UTC Sunday.

Duration in VK6 only: 0400 UTC Saturday to 0400 UTC Sunday.

Sections

A: Portable station, single operator, 24 hours.

B: Portable station, single operator, 6 hours.

C: Portable station, multiple operator, 24 hours.

D: Portable station, multiple operator, 6 hours.

E: Home station, 24 hours.

Single operator stations may enter both Section A and Section B. If the winner of Section A has also entered Section B, his log will be excluded from Section B. The same applies to the winner of Section C if the station has also entered Section D.

General Rules

A station is portable only if all of its equipment is transported to a place which is not the normal location of any amateur station. Operation may be from any location, or from more than one location. You may work stations within your own locator square. Repeater, satellite and crossband contacts are not permitted.

One callsign per station. If two operators set up a joint station with shared equipment, they may choose to enter Section A or B as separate stations under their own callsigns, or Section C or D under a single callsign. If they enter Section A or B, they may not claim contacts with each other.

Stations with more than two operators must enter Section C or D. Operators of stations in Section C or D may not make any contest exchanges using callsigns other than the club or group callsign. No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for any contest activity. Suggested procedure is to call on .150 on each band, and QSY up if necessary.

Contest Exchange

RS(T) reports, a serial number and your four digit Maidenhead locator.

Repeat Contacts

Stations may be worked again on each band after three hours. If the station is moved to a new location in a different locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

Scoring

For each band, score 10 points for each locator square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

6 m	2 m	70cm	23cm	Higher
x 1	x 3	x 5	x 8	x 10

Then total the scores for all bands.

Logs

Logs should cover the entire operating period and include the following for each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

Cover Sheet

The cover sheet should contain the names and callsigns of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest manager's decision will be accepted as final.

Please use the following format for your scoring table. In this example the operator has operated from one locator and worked four locators on each band:

Band	Locators Activated (10 pts ea)	+ Locators Worked (10 pts ea)	+ QSOs (1 pt ea)	x Multiplier	= Band Total
6 m	10	+ 40	+ 40	x 1	= 90
2 m	10	+ 40	+ 30	x 3	= 240
70 cm	10	+ 40	+ 20	x 5	= 350
Overall Total					= 680

A sample cover sheet has been posted on the VK-VHF e-mail reflector, and copies can also be obtained from the e-mail address given below.

Entries

Paper logs may be posted to the Manager, VHF-UHF Field Day, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to jmartin@xcel.net.au. The following log formats are acceptable: ASCII text, MS Office RTF, DOC, XLS or MDB. If you use Office 2000, please save the files in Office 97 format.

Logs must be received by Monday, November 24, 2003. Early logs would be appreciated.

Rules PSK Rumble

-sponsored by Troy ARA

Saturday, October 4th, 2003. 0000z - 2400z PSK only. 80,40,20,15,10,6 metres.

Work stations once per band. Exchange name, state/province/DX send dxcc prefix. Operate 1 of 5 categories: Normal 100w max.; Great,20w max.; Super 5w max.; Novice or SWL.

Final score is QSOs (W + VE + JA + VK call areas + 1 point per DX incl. your own). Mults. count once per band. To be valid, scores must be received via our online score submission form found at "http://www.n2ty.org/seasons/tara_rumble_score.html" or e-mail.

Check-Logs to:-

rumble-manager@n2ty.org by the last entry date 1st November 2003. Logs must be available for review if requested. Please read web rules for details on "http://www.n2ty.org/seasons/tara_rumble_rules.html"

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SUMMER VHF-UHF FIELD DAY 2003 RESULTS

contest manager: John Martin VK3KWA

Activity in this Field Day was quite high, in spite of the hot weather and fire restrictions in some areas that forced some stations to restrict their operation. A number of stations submitted logs for the first time this year, especially in the 6 hour and home station sections. Thanks to all for supporting the Field Day and helping to increase the activity.

A few months ago there was some e-mail discussion of possible rule changes. There was some concern that the scoring advantage of microwave stations and grid hoppers could discourage others who don't have microwave gear or may not be able to activate more than one grid square. But the logs show that there has been a significant increase in activity, so maybe the rules don't need fixing.

But I would appreciate comments about grid hopping. At present there is no limit to the number of grids that any station can activate, and this means more effort, more driving and lost operating time. I wonder if it would be a good idea to have a limit on grid hopping - say no more than two squares. There may be many amateurs who can find two different sites within reasonable driving distance, but there are only a lucky few who happen to live within a reasonable distance of a four-grid intersection. A limit of two grids could reduce the pressure and create a more level playing field. It could even lead to an increase in the number of grid hopping stations.

Any comments on this or any other aspects of the rules are welcome. email jmartin@xcel.net.au.

SUMMER VHF-UHF FIELD DAY 2003 RESULTS

Call	Name	Locator(s)	6 m	2 m	70 cm	23 cm	12 cm	9 cm	6 cm	3 cm	TOTAL
Section A:		**Single Operator, 24 Hours**									
VK3WRE	R. Edgar	QF31	110	633	930	928	840	700	700	830	5671
VK3AEF	J. Bywaters	QF03	80	555	645	384	-	-	-	-	1664
VK4OE	D. Friend	QG61, 62	-	336	420	360	-	-	-	220	1336
Section B:		**Single Operator, 6 Hours**									
VK3KAI	P. Freeman	QF21,22,30,31,32	77	324	530	608	650	540	430	540	3699
VK3BRZ	C. Gnaccarini	QF21	-	507	715	432	350	-	-	-	2004
VK3AXH	I. McDonald	QF12	110	441	630	512	-	-	-	-	1693
VK3UH	L. Mostert	QF21	79	246	390	340	-	-	-	-	1055
VK3HV	G. Francis	QF21	79	243	380	-	-	-	-	340	1042
VK3AFW	R. Cook	QF22	107	441	490	-	-	-	-	-	1038
VK5DQ	K. Gooley	PF95	40	138	205	264	-	-	-	-	647
VK5ZUC	A. Russell	PF94, 95	33	213	345	-	-	-	-	-	591
VK3QB	C. Chapman	QF32	101	234	231	-	-	-	-	-	566
VK5JQ	J. Sayers	PF95	38	138	195	184	-	-	-	-	555
VK3KG	P. Elton	QF22	68	282	180	-	-	-	-	-	530
VK5UE	C. Low	PF95	-	123	185	192	-	-	-	-	500
VK5AR	A. Raftery	QF04	21	157	230	-	-	-	-	-	408
VK3BJM	B. Miller	QF22	58	336	-	-	-	-	-	-	394
VK5XE	I. Northeast	PF96	33	102	165	-	-	-	-	-	300
VK4EV	R. Everingham	QG62	-	114	175	-	-	-	-	-	289
VK4LP	J. Lemura	QG62	-	41	40	-	-	-	-	-	81
Section C:		**Multi Operator, 24 Hours**									
VK3ATL	GARC (1)	QF22	198	768	910	928	490	-	-	-	3294
VK2TWR	(2)	QF43	150	693	815	440	-	-	-	-	2098
VK5ARC	SCARC (3)	PF94	224	555	520	-	-	-	-	-	1299
VK5BAR	AHARS (4)	PF95	183	393	415	176	-	-	-	-	1167
Section D:		**Multi Operator, 6 Hours**									
VK3BG	(5)	QF24	112	492	605	616	-	-	-	-	1825
VK3APC	MDRC (6)	QF22	92	417	545	-	-	-	-	-	1054
VK3BSY	(7)	QF21	-	249	-	-	-	-	-	-	249
Section E:		**Home Station, 24 Hours**									
VK3FMD	C. Kahwagi	QF22	-	486	795	800	480	220	220	-	3001
VK3EK	R. Ashlin	QF32	130	522	720	512	340	220	230	230	2904
VK3AUI	G. Sones	QF22	124	297	460	488	-	-	-	-	1369
VK3AFW	R. Cook	QF22	-	417	680	-	-	-	-	-	1097
VK5USB	R. Pipe	PF95	64	171	225	168	-	-	-	-	628
VK3BJM	B. Miller	QF22	35	177	235	-	-	-	-	-	447
VK5AIM	S. Mahony	PF95	24	117	150	96	-	-	-	-	387
VK5HKT	K. Thole	PF95	-	150	225	-	-	-	-	-	375
VK1WJ	W. Jirgens	QF44	45	138	175	-	-	-	-	-	358
VK2CZ	D. Burger		53	-	195	-	-	-	-	-	248
VK3JQ	I. McLean	QF22	46	69	110	-	-	-	-	-	225
VK2JHN	W. Munn	QG61	103	-	-	-	-	-	-	-	103

Check Logs:

Thanks to W. Memphis VK2KWM, P. Pavey VK3VB, M. Millar VK5MX, P. Loveridge ZL1UKG.

(1) Geelong ARC: operators VK3YXK, VK3HFX, VK3BCL, VK3HFY, VK3XLD.
(2) Operators VK2TWR, VK2XKE, VK2IJM.
(3) South Coast ARC: operators VK5KBJ, VK5PCY, VK5HSX, VK5KDO, N. Parr.
(4) Adelaide Hills ARC: operators VK5PH, VK5BV, VK5DC.
(5) Operators VK3BG, VK3AHY, VK2RO, VK3KLN.
(6) Moorabbin & District ARC: operators VK3YE, VK3OR, C. Long.
(7) Bellarine Secondary College: operators VK3TRD, A. Bent, C. Lewis.

(I know - they're old results but I was asked if I had them, and could print them. Besides the next one is nearly on us and you should survey the results to plan your attack this year! -ed)

CB-Radio Contesting!

prepared by Darren Johnson

11m World Wide Field Day (WWFD)

A WHOPPING seventy-five DX teams from countries all over the globe, including six different continents, participated in the 2003 World Wide Field Day (WWFD) which concluded in September.

The 2003 WWFD enjoyed by far its highest involvement of groups and individual operators since the Contest's birth in 2002 and, given the success of this year's event and the high level of interest it generated, participation levels are certain to skyrocket in 2004.

As the contest was a 'Field Day' (ie. a day in the field), WWFD teams were not permitted to use ground-fixed antennas OR their normal QTH as a transmission base, having to use a car, caravan, tent or maritime mobile station etc. Teams were also required to use a generator or batteries and were not allowed to draw on normal power supply (110/230 voltage) to charge transceivers.

This strict protocol, however, did not negatively affect the success of WWFD teams, who generally reported excellent propagation, a large number of DXCC (some rare) on the log, and a lot of fun for their troubles.

A major attraction for DX groups in this year's contest was that teams were allowed to participate using their own Club callsign. (For example, Italy ex. 1AT/FD001, Australia ex. 43SD/FD001, New Zealand ex. 41DT/FD001 etc.). This decision proved to add significant appeal to many operators who were keen to maintain their identity with one particular club, despite their involvement in an externally organised event.

WWFD contacts were possible on SSB and FM modes and occurred between frequencies 26.965 MHz to 27.405 MHz (Channels 1-40 Australian) and from 27.600 MHz to 27.800 MHz.

Fortunately, many Australian CB'ers made the logs of European stations working on lower frequencies, such as 43LD101, Dave, who worked the Alfa Tango station from France on 27.405 MHz USB, the Romeo Charlie station from England on 27.395 MHz USB and the WWFD station from Ireland on 27.365MHz. Well done, Dave!

How To Tally Your Points

Although ALL logs should have already been forwarded to WWFD Contest Managers, operators can calculate their own points to check their eligibility for Contest Awards.

Points are calculated using this formula:

- 1 Point for a QSO
- 5 Points for a DXCC
- 10 Points for working a participating team (a /FD-station)

Points are then multiplied with the total number of worked /FD-teams to come up with an end total.

Example

90 QSO X 1 = 90 points

15 DXCC's X 5 = 75 points

20 /FD-stations X 10 = 200 points

Total points 365 X 20 /FD = 7300 points.

Good Luck Next Year!!!!!

Darren Johnston

ABOUT THE WWFD.DK

The WWFD.DK is a non-profit and neutral organisation that is not related to a specific club or group. Although its sole purpose is to organise the World Wide Field Day Contest, the general aim of the WWFD.DK is to promote friendship for the entire 11m community.

In addition to that, the organisation also sees itself as a serious partner for existing DX Groups, aiming to give clubs on 11m the possibility to strengthen relationships among existing members and also with members of other clubs.

As is the case with most other contests on 11m, participants do not pay anything to take part in the event. The WWFD.DK, therefore, relies heavily on the support of clubs and groups and the sponsorship of businesses associated with the hobby. All prizes, including trophies and diploma certificates, are donated by sponsors.

Baudwalking

by Tom Sundstrom, W2XQ w2xq@arrl.net

Greetings, all. Since the demise of "past issues", Bob Harper has invited Baudwalking back for a new run. What are we doing here? It is a bit of everything Internet that we believe may be of interest directly or indirectly to those who participate in the business or hobbies of radios and communications.

Ye scribe has been kicking around the planet since 1942. Shortwave listening began with a 1943-vintage Hallicrafters S-38 in 1952; through we had learned the code at an early age, the amateur radio license didn't arrive until after university, marriage, job and a home purchase occurred in the 1960's and 1970's.

After running a telephone bulletin board system in the 1980's into the 1990's (remember BBS's) I moved onto the Internet in 1994 at [w] trsc.com. Come have a look.

Abbreviations for Baudwalking

What's with that "[w]"? I have adopted a syntax to eliminate repetitive "http://www" and "mailto:" et al that precede the standard Web notation found in print and Web media. The idea is not original. I discovered the idea in several UK digital photography magazines that use this notation, and the body of that text seems easier to read. Within brackets, the letter "w" is for a Web URL, an e-mail addy, FTP, gopher, a media device/player; and Web.

The Browser Business... who is on first?

In the past few months the Web browser business has changed quite a bit. Some of our acquaintances know the length of time we've been on the 'net and asked us what is going on. Here is our take on the current 2003 third quarter situation.

The big bad gorilla Microsoft has been fighting court battles. Is Internet Explorer part of Windows or not? Is Windows an operating system (OS) or not? More money than we can count has been spent in United States state and federal courts arguing these questions and questions of monopoly. Our perspective? Microsoft has 95 percent of the business personal computer market and these annoying questions are just pesky flies about to be swatted.

In August 2003 we read news summaries suggesting that will be no more separate Windows standalone Internet browsers. That should finally settle the monopoly court case.

Further, an Apple magazine's press clips noted that Microsoft, in the face of competition, discontinued the standalone Microsoft Apple IE browser.

It swept the dust bins for bug fixes and issued a final version, perhaps 5.2 or so. Microsoft's position is that IE was losing ground to Apple's own Safari browser that just went final as version 1. From our perspective it seems more likely that IE as a separate product disappeared in concert with the missing Windows standalone piece to quiet the court case.

What about Netscape?

Way back, a few years ago, AOL bought Netscape. The online service and TimesWarner, publisher of Time magazine and a ton of other print and video had a big happy marriage a while ago but the tech stock market crash since 1991 or so has reverberated throughout AOL Times Warner. Circulations are down, TV viewing is down, AOL membership, revenue and profits and down, and Netscape as a tiny development office has apparently little or no money for research and development. That suggests bug fixes will be slow and new features are unlikely to see the light of day.

Opera [w] opera.com continues to battle along and unique in supporting 10 or so platforms and about a dozen languages. That in itself is quite fantastic. From time to time there are complaints about the technology not being kept up to date, but there is a working browser for FreeBSD, Solaris, Symbian OS, BeOS and OS/2.

If there is a downside, there is a one-time cost of US$30 for the product, and lesser charges with significant upgrades. The free version of Opera delivers a small amount of advertising into a portion of the browser window.

Let's get back to reality. In our work and home environment, we have to deal with a stodgy Windows 2000 network box and our properly-behaving Apple Mac G4/800 with OS X 10.2.6. The bookmarks (favorites) after almost 10 years of research and writing are almost 1.1k in size.

The short-story answer to our cross-platform requirement is Mozilla [w] mozilla.org. Many of the persons behind the volunteerism of Mozilla were with Marc Andersson of Netscape at Web dawn, and the coding of Mozilla finds its way into Netscape. The support and user community of Mozilla is huge.

We run alpha versions with a talkback facility with little difficulty, but there are slightly older beta and final editions to choose from if more stability is sought. The Mac and Windows interfaces are totally consistent, and we easily import and export and backup a single 1.1k bookmark file as we move between computers.

I really like the tabbed browsing feature that opens more than one window in one instance of running Mozilla. It is a nice feature when researching a topic. With many tabs open, one click can bookmark all tabs into one folder.

Conversion programs to convert favorites to bookmarks are plentiful, but note that with all such programs bookmarks containing data in the keywords and dialog fields of the properties dialog box will be lost upon converting to favorites.

Always backup your favorites and bookmarks before converting to another form, just in case something goes amiss.

Mozilla has an army of third party developers too. More than 100 of these goodies can be found at [w] mozdev.org and that includes the Google Search Toolbar, [w] toolbar.google.com a variant on the popular Microsoft Internet Explorer offering. Mozilla has a sidebar with useful tabs, and LiveSideBar [w] livesidebar.com expands the browser's left-side capability. Have a look!

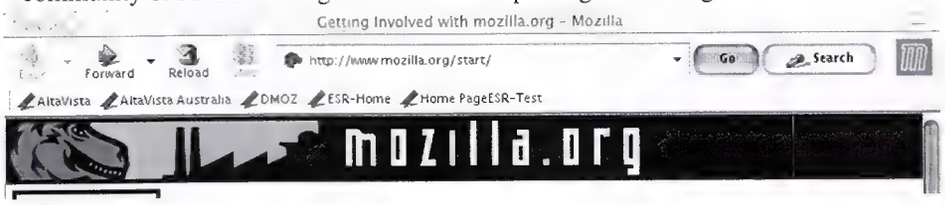
Google Hacks

Somewhere in the mountain of reading material that recently crossed this desk I saw a news article about another consolidation of firms that run search engines of various flavours.

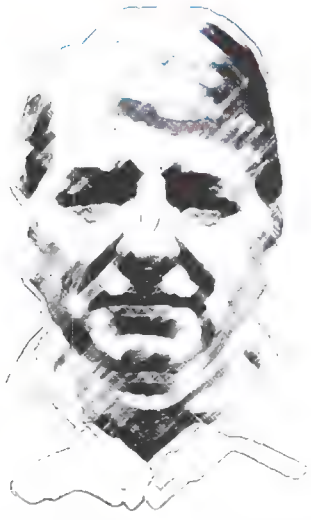
The essence of the story is there are only two super-search companies left, and everything else seems to be smoke and mirrors as front ends into these two firms. One-half the answer heads this paragraph; the other is Yahoo.

So what do we do? Yahoo requires one to beg and pray, or pay, a live person to review, categorize and rank a new or changed Web site.

New listings are increasing difficult to place without payment. Google operates a spider and once the spider visits a site it is likely to continue indexing and updating the findings.



Baudwalking



The consumer, the end-user, who can effectively search Google's massive holdings holds a significant advantage over the casual user who just types in a few words. Computer books hardly read like a spy novel, but this one held my attention for several evenings and now stays close as a ready reference:

O'Reilly, Sebastopol, California, USA. Tera Calishain & Rael Dornfest. Google Hacks: 100 Industrial-Strength Tips & Tools. ISBN 0-597-00447-8, first published 2003. [w] oreilly.com/catalog/googlehks

Two quick adjustments to Google Preferences begins the job of making Google work better. Go to the bottom of the Preferences page. Google by default returns 10 results per page. Change it to 100. As this is all text based, there should be no change in speed.

Next, for the Results Window, click the check box to open the results in a new window. Save your changes (cookies must be enabled) and test your work. With the second change, you won't have to repeatedly scroll down the long Yahoo results list.

The book has a supplemental Web site with additional hacks. Dial into [w] http://hacks.oreilly.com/ and have a look around. There is another Google hack page, Happy Piles of Google Hacks, at [w] buzztoolbox.com/google} that seems worth exploring. Enjoy!

Attention to Details?

It is really quite astonishing to me how many amateur radio Web site managers fail to attend to broken links on their Web sites. Rather than do something to fix the situation, the Webmaster announces to the world that the link is broken and continues to propagate incorrect data.

(Oops, gotta go, there's something I forgot to do... —ed.)

Such is the case with KG0ZZ. Many moons ago, in the mid-1990s, Paul Tadlock of Kansas, USA, shared with us amusing ham radio clip art through his Web site hosted on qni.net. In 2003 several would-be amateur radio super-link sites proudly display "link noted as dead 03-13-02" or words to that effect. And I ask why? A quick trip through the callbook sites turned up the correct clip art URL of [w] pages.prodigy.net/kg0zz/clipart/.

Would you like to see another example of something that should die? Ron Klimas, WZ1V, did hams a favor in 1991 with a booklist of 4500 links. More than a decade later, wrong and broken Web addresses generate constant e-mails of "how come...?" and WZ1V finally had to pull the e-mail plug on the page on the page's embedded links.

Amateur radio clubs and individuals continue to post and distribute this list as gospel. Want to see the page? Dial up [w] http://newsvhf.com/ham-html and look under "software/computer" for our PC -- DOS -- software by W2XQ that was last sold about a year after Windows 3.1 was introduced, at a URL that no longer functions. It is aggravating.

New Ham Radio Web Sites

Charles Bautsch, W5AM, Texas, has re-established a large amateur site in memory of Charles Kinsolving, W5CJ. It's called RADIOING.com, and global categories include an introduction to amateur radio on virtually any mode you can think off, up to space communications, ham radio museums with an emphasis on Collins, and links galore.

The site is extensive but it probably will be slow on a dial-up line as the menu pages are graphics-laden.

On most of the menu pages the visitor doesn't see the menu until pressing the [PgDn] key at least once. Bummer. Nevertheless, have a read at [w] radioing.com and build a macro or to maneuver around the site.

Robert Casey, WA2ISE, New Jersey, made up an interesting set of True Type Fonts. Free for the public domain, they include "Old Time Radio", "Vacuum Tube" symbol font for schematics, 'Cat Face", Christmas Tree," "Comet," 'Morse Code", "Saturn", and a backwards Arial TTF font suitable for applying to tubes. Dial up [w] geocities.com/CapeCanaveral/9178/fonts.html.

Quickies

Unfortunately the experimental NASA service "Space Station Science Picture of the Day" at science.nasa.gov/ppod/ came to an end on June 13th.

No pictures have been posted for the past few months. You might check the URL from time to time to check developments. If you like what you see, why not drop Dr. Tony Phillips, Production Editor, a note of encouragement.

Until Next Month...

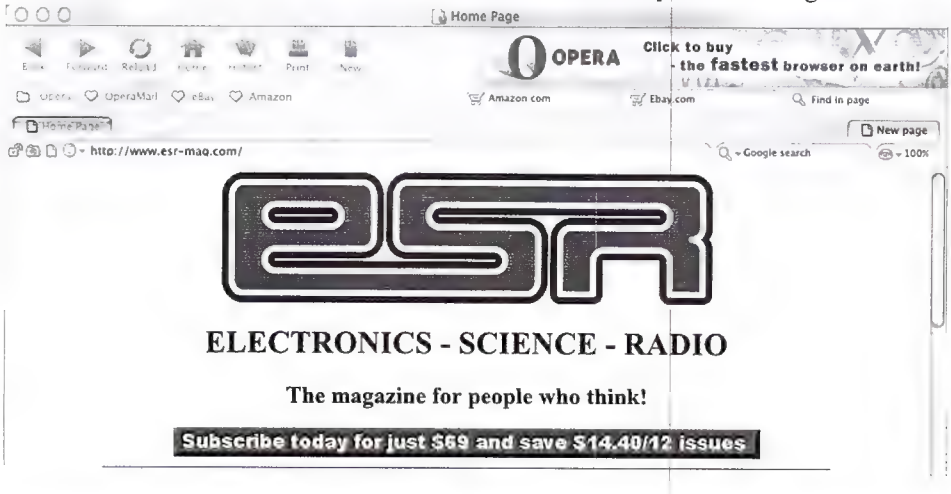
Echolink, one of the two popular voice-over-IP methodologies, has come to a repeater near W2XQ. I'm not on the air all the time from home as node #2161, but you may catch me in the car via WA3BXW-R (node #88314).

The repeater has a silent period of 2300-0600 local Eastern time (Atlantic coast, US). The weekday M-F commute window is rather small: 0600-0700 and 1600-1700 local time. Don't forget that the US switched to summer time on the first Sunday of April and returns to winter time on the last Sunday of October.

The times are probably peculiar but we've talked to readers in years past, and it has been fun.

The Web sites at trsc.com and w2xq.com have been cleaned up a bit in the past few months. Questions, comments, suggestions for the Web sites and for this column are wanted. How can we help you?

We wish ESR and Bob Harper, VK4KNH, all the best in filling a void. Do write and say hello once again!



Modifications

by Greg Towels VK2GJT *mods@esr-mag.com*

MODIFICATIONS FOR ICOM IC-275A/E/H, IC-475A/E/H, IC-575A

Here are a collection of modifications for the older Icom range of radios being IC-275, IC-475 and IC-575. Have fun.

Disabling Of SSB Squelch

Squelching is nice to have in FM mode, but it doesn't really work for SSB, where you will be looking for weak signals. Therefore you have to adjust the squelch level every time you change mode. This mod will be useful to those that are getting involved with 2m and up SSB operations.

The way to disable SSB squelch is fairly simple, and is achieved by just cutting the connection to the SSB input of the squelch circuit in some way.

The easiest way to break the connection is to connect the base of Q7 to ground. The base is the lead facing into the centre of the PCB.

Very Fast AGC

For some modes of weak signal communication, it can be desirable to have a very fast AGC (e.g. meteor bursts with a sharp rise and a long weak "tail"). The standard fast AGC has a time constant of about 2 secs (!), which also means that a noise pulse can mute you for quite some time.

It is important to note to never use the noise blanker when receiving high speed CW (Meteor Scatter). The noise blanker mistakes the high speed keying for noise pulses, and will seriously corrupt the signal.

The solution is to move the "AGC fast" capacitor (C19) to replace the "AGC slow" capacitor (C20). You will loose the "AGC slow" option, but most operators will find "AGC fast" adequate for most signals.

Another solution is to switch out the "AGC fast" capacitor (C19) separately, but then you will get the problem of finding an appropriate front plate switch. You might consider using the DATA button, but it cannot be activated in CW.

Remember that a strong signal will be seriously distorted in AGC OFF mode. The way to do it is to remove C20, and to move C19 to replace C20.

SSB RF Gain

The RF GAIN function is different in FM and in SSB/CW modes. In FM mode the RF GAIN controls a PIN-diode at the input of the preamp. In SSB/CW the RF GAIN simply activates the IF AGC.

The use of the preamp input attenuator (the PIN-diode) can be useful also for SSB/CW e.g. if you have connected a mast head preamp with excessive gain. In this case the attenuator will help you to adjust the signal levels at the mixer, and thus reduce intermodulation and blocking.

The way to fix it is to remove the SSB/CW RF GAIN for SSB/CW (this function is of little use anyway), and enable the FM RF GAIN even in SSB/CW.

How to do it? I'm glad you asked. Just cut the lead (FM8V) connected to (pin5, J6, potentiometer PCB, green) about 4 cm from the plug. Connect the short plug end with R14 (on the potentiometer PCB) by soldering it to the end that is connected to the plug (+8V)

This will enable the FM RF GAIN in SSB/CW.

Cut resistor R30 open. This disables the SSB/CW RF GAIN, and you now have a variable input attenuation with a dynamic range of 10dB (IC275 with MI308/1nF) to 16 dB (IC475).

FREQUENCY RANGE & CTCSS tones

The IC-275 have capability to cover 138 - 174 MHz and the IC-475 has capability to cover 430 - 450 MHz. Because of hardware restrictions they might not be fully up to specifications in all of the band, but an extended range can be interesting for e.g. use with a transverter. It seems that the IC-275 has a parallel wide band preamp, that can be switch via the WBT pin on RF-YGR PCB.

In the European versions the transceivers are wired for 1750 Hz repeater call, and they have no CTCSS capability. The transceivers have a built-in CTCSS encoder, so these functions can be restored.

Both of these version dependent functions can be set by the diode matrix: D20 - D24 in the logic unit. I do not know the exact mapping, but a lot can be derived from studying the different frequency ranges and the diode matrix coding table found on the schematic diagram.

TS950 RX DIGITAL NOISE

Some early TS-950SD transceivers may exhibit a low Signal to Noise ratio on ten and fifteen meters. In addition, rotating the encoder may allow the user to hear a crackling noise in his headphones. The following modification will correct this condition.

Note: This modification has already been performed on models from serial number 101xxxx.

Disconnect the power cord and antenna. Remove the top and bottom covers (18 screws). Open the subchassis by removing 4 top screws, remove 3 back panel screws, unplug the RX ANT OUT and DRIVE IN connectors.

Remove the cover from the subchassis (by removing 12 screws). Remove the 9 screws from the filter board. Desolder the antenna connector wires at the antenna connector.

Be careful! Do not damage the surge absorber. Rotate the Filter unit to expose the foil side of the board. Disconnect coax cables as necessary to rotate the board and remove the mesh plate as the board is rotated.

Cut the two foils. Assemble the transceiver by reversing the earlier steps. Remember to install the mesh plate, resolder the antenna connector, and plug in the two connectors on the back panel

DX-70 Noise Blanker Mod

Perhaps the most common complaint among Alinco DX-70 users has to do with the poor performance of the noise blanker (NB). I have to agree, the NB in my DX-70 is lousy, the only use of it being to detect the neighbours cars going past our residence.

Like other DX-70 users, I've found that the NB virtually destroys the desired signal, especially if the noise source is ignition noise from an engine operating at normal highway RPMs. Unfortunately, Alinco is unable to offer a remedy for the problem.

A noticeable improvement can be made to the noise blanker by changing the value of C324 on the Main Board to a smaller value. This mod allows the noise blanker to attack more quickly on noise pulses and it also reduces the duration of the blanking action.

It is also necessary to verify the value of R392 to ensure the correct NB time constant exists. These components are located on the backside of the Main Board, which is the PC board located under the unit's top cover.

This mod takes the NB from being virtually worthless to being at least somewhat useable on impulse noise from ignition systems and power-lines.

While I'd like to see still better performance from the NB, this appears to be about the best I could do with only minor changes to the circuitry.

You will need the following parts - 0.039 uF capacitor, 0603 size (or a 0805-size part can be made to work). Perhaps a 10 k, 0603 resistor, 5%, depending on your radio.

Read this procedure carefully before you start to pull apart your radio. This modification involves raising up a printed circuit board and replacing one or two small 0603-size components. While this is not a particularly difficult task, it does require some skill with working with surface-mount components and PC boards. If you are not comfortable with working with very small surface-mount components, refer the task to someone who is.

With DC power removed from the unit, remove the front panel and disconnect the two connectors from the front panel. Note the way the cables are routed through the plastic blank plate on the front of the radio. Remove the microphone.

Remove the radio's top cover (5 screws) and the bottom cover (7 screws). Remove one screw holding the blank plate to the front of the chassis. The blank plate then snaps off the upper and lower front chassis rails.

Remove the two screws securing the speaker bracket. Lift the speaker and bracket up and away (and you can disconnect it at the PC board connector if you want to get it out of your way).

Remove the two screws securing the front top rail, and remove the top rail. Remove the two screws securing the front bottom rail, and remove the rail by pulling it forward to disconnect the connector that is located near the microphone connector.

Pull up and remove the small PC board (Connector Unit) that the front panel cables attach to. Remove the two spring clips that secure the two ICs (IC11 and IC20) to the chassis on the left side of the unit.

Disconnect the two coax cables (J3 and J4) near the front of the Main Board. Disconnect the ribbon cable that goes into the front of the Main Board. To release the ribbon cable from the connector, use a pointed tool to push forward the locking tabs located at each end of the connector.

Remove the 6 screws holding the Main Board to the chassis and carefully lift the front edge of the Main Board up and lay the board back onto the transmitter's heat sink. The remaining cables to the Main Board are left connected.

Using the photograph on this page, locate C324 on the bottom side of the Main Board and remove it. Replace it with a 0.039 uF (39000 pF capacitor). A 0603-size part fits on the original pads. A slightly larger 0805-size capacitor can also be used if you first scrape away a bit of the solder mask on the ground end to accommodate the larger part. (as shown in the photo to the right.)

Locate R392. Verify that it is 10 k ohms. The value code "103" is printed on top of a 10 k resistor in very small print. (Placing an ohmmeter across R392 in the circuit will read about 6.5 k to 7.5 k, depending on the polarity of the ohmmeter leads, assuming if it is a 10 k.)

My DX-70 came from the factory with a 10k, however the schematic in the service manual shows it as being a 4.7k. If the value is other than a 10k, replace it with a 10 k 0603-size part. Reassemble the unit, reversing Steps 1 through 9 above. Remember to push the locking tabs back in after reconnecting the ribbon cable. Also be sure to carefully align the connectors when reinstalling the connector unit

Now go for a drive and see what you think of the NB performance. With the NB turned on, you will still hear a portion of the desired signal being cut out during the blanking action, but the signal can generally be heard through it.

If the interfering signal is relatively weak, you may be better off running with the noise blanker off. On some signals a bit of a reduction in the level of the desired audio may also be noted when the NB is switched on. Remember that the best way to get rid of ignition noise is to suppress it in the vehicle itself.

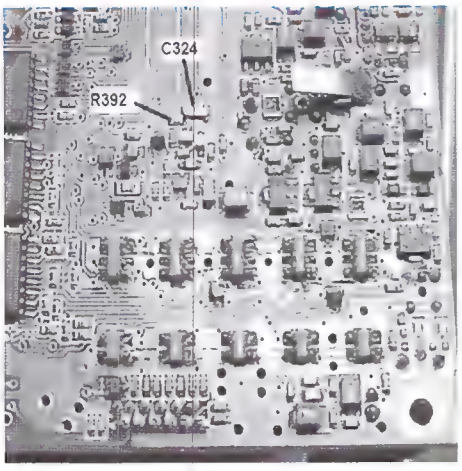
TS-430 Power Mod

This modification allows the squelch control to vary the power of the TS430s from a couple of watts to full power. The squelch control still operates on FM mode but is disabled on SSB. [not very useful anyway.]

Remove the transceiver top cover. The main board on show is the IF unit. Locate socket 26, with the front of set towards you socket 26 is to the left of the board about midway back to front. Cut the wire to pin 6 leaving about 3cms wire on the plug. This wire is usually brown. The wire tail from the plug has to be connected to ground, This enables SSB receive, pin 4 is ground and can be used.

The brown lead you have □st cut comes from the small PCB behind the squelch control.

It runs to pin 6, socket 6 on this board. It is the end pin to your right looking from the front of the set. Pull this brown wire free of the harness so that you have a free lead from the plug.



Locate R211, a 1□ resistor which connects the source of □41 to ground. From the front of set.. right hand side, towards the front of the board.

Cut the ground side of R211 leaving sufficient lead to solder to. The ground side should be the top end of the resistor, but check. Take the brown lead from the squelch board, suitably shortened, to the resistor. The squelch control , SSB section, is now in series with R211 and gives excellent control over the RF output level. Replace cover. The modification is now complete.

In use, maximum power is with the control fully anticlockwise. With the squelch pot set anticlockwise and the set in CW mode, Transmit a carrier [you will need to short the key □ack]and set the carrier control for full power.

You can then vary power on all modes using the squelch control. Check the carrier control setting required for different bands, it will probably vary slightly between 160 and 10 metres.

The protection circuits will still operate as before but if running low power the set will tolerate poor aerial matching without using the protection circuits. ESR

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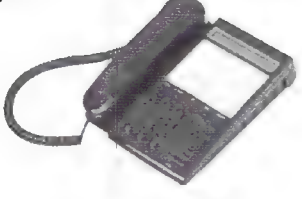
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News from the North

Australian Reef Pilots -by Darren Johnston dazza@esr-mag.com

"ALL SHIPS, ALL SHIPS, ALL SHIPS! This is 'Superstar Leo' passing Harrison Rock buoy and entering POW Channel at 900 hours east-bound."

Most organisations involved in maritime safety rely heavily on radio communications. Whether it be for establishing contact with stricken vessels, for coordinating search parties and sea rescues, or for broadcasting important data such as tide and WX information, radio communications is a vital player in safety at sea.

The AUSTRALIAN REEF PILOTS Pty Ltd plays a significant part in maritime safety in the Torres Strait Islands (OC-138) region by providing compulsory pilotage services for large ships through treacherous patches of Great Barrier Reef between Papua New Guinea and Cape York Peninsula and down the VK4 coast to Cairns.

Radio operation, for them too, is a necessary part of the service, in terms of being able to communicate with the ship's captain and reef pilot boats from the base on Thursday Island.

With this in mind, I set about organising a QSO with owners Dan and Joan Shepard, to learn a bit more about the job Australian Reef Pilots does in the region and hopefully hear a few stories of 'mishaps and misadventures' worth sharing with ESR fans!

Not having much clue about the business of reef piloting, except that without it, the Torres Strait seabed would look more like an underwater graveyard –of ships, I rocked up to the Australian Reef Pilots headquarters on John Street, TI, ready for an extensive learning journey. There, I was greeted by both Dan and Joan, who were busy doing some maintenance on an old yacht named the 'Golden Legend' in the side-yard.

Embracing my hunger for knowledge, Joan welcomed me inside the premises for a squiz and began feeding me some interesting facts about the Australian Reef Pilots (ARP) organisation and a bit about the history of reef piloting in general.

I was shocked to learn that the ARP has TWO bases in OC-138 - centres that last year serviced close on 1,400 ships, including petroleum, bitumen and oil tankers, and ships carrying livestock and box containers. Joan also confessed that they'd even 'tug 'n' towed' an oil rig!

The main establishment was the one I was standing in, while a smaller base existed on distant Yorke Island, 100 or so nautical miles from the coconut palm dotted coastlines of OC-153.

Joan explained that there are 26 pilots contracted to the Company, but that no more than nine worked out of bases in OC-138 at any one time.

To satisfy their accommodation needs, the base on Thursday Island has 10 single rooms. A full-time chef caters for their tucker needs while a part-time cleaner maintains living quarters. A terrific place for off-duty pilots to kick back and enjoy a couple of quieties is the entertainment room which is also attached to the premises.

Of particular interest to me, though, was the radio communications room, (What we radio fans would call "THE SHACK!") where UHF and VHF marine frequencies are monitored 24/7.

The transceivers consisted of a compact black coloured KENWOOD UHF radio and a white GME Electrophone GX558A VHF. These, I was told, were used to communicate through a repeater on nearby Prince of Wales Island with passing ships and pilot boats and to monitor the designated pilot boat frequencies which I knew already to be channel 20 VHF. (This thanks to a recent fishing trip to Fantome Reef with a couple of mates and being told in no uncertain terms to "F#$% OFF to another channel!").

Joan also explained that ARP HQ uses handheld UNIDEN Auto Sea phones to communicate with off-duty crew based on the Island. Given that reef pilots can be called upon at any time, handheld radios she said, were "the most reliable mode of communication available" to them on T.I. On call that is, provided they have had a 24hr break after their last pilotage.

The HQ's radio room, in some ways, resembled the shack of a diehard 11m DX enthusiast or amateur radio operator. The walls were adorned with a series of comprehensive maps, cluttered with post-it notes, post cards that could have easily passed as QSL cards, and other pinned documents. Shipping charts showing every QTH from Cape York Peninsula to the southern islands of 91 and 101 divisions were also visible, as too was a world-clock sitting on a shelf above the transceivers.

A large whiteboard showed names of ships such as Bunga teratai dua, Anl Albany, Amstelgracht, Yang Hai, Carl Oldendorff, Cristal, and the Superstar Leo (a Malaysian luxury ocean-liner), their estimated time of arrival (ETA) at boarding grounds and the name of the pilot and boat undertaking the pilotage, also caught my attention.

Returning inside for a cold Gulf Lager and a spell from the sizzling tropical heat, Dan pointed out a WX and Tidal Board in the room, referred to when calculating ETAs and appropriate boarding grounds. He went on to say that VHF transmitted tidal gauges were made available to ships' captains and that utilisation of daily tide rises enabled the ARP to pilot ships with a maximum static draft of 12.2 metres. (I think that equates to around 40 feet for you old timers!)

Over an ale in the entertainment room, the conversation progressed more to the operational side of the business. Two pilot boats, I was told, operate from this QTH. Referring to a series of photographs, Dan told of an impressive 12 metre aluminium 400HP jet boat named 'Waiben', the title of which is derived from the traditional name for Thursday Island - Waiben, meaning 'dry island' for its lack of fresh water.

The other is an older vessel called 'Torres Five' (Otherwise known by some of the coxswains as 'The Old Faithful'), which has a flared bow, making it more suitable for rough stuff. Both vessels are moored at the Thursday Island main wharf when not on piloting duty.

The pilot boat on remote Yorke Island is called the 'San Pedrico'. Dan tells how it once survived an encounter with a terrifying water spout near Darnley Island in the Strait's far east.

The crew on each boat consisted of one coxswain, one deck hand and a pilot, but as I was about to find out, this was subject to change on special occasions. Especially for a young journalist on assignment for one of the world's most comprehensive radio and communications mags! Deciding that the BEST way to see what reef pilotage involved would be to get out on the water and SEE FIRST HAND, Joan invited me to take a ride on the 'Waiben' with coxswain David Kerr and his crew. As you could imagine, it was an offer I leapt at!

Dave, the crew and I left Sea Swift Jetty at around 6.00am on Wednesday morning. It was windier than usual and white caps on swell in TI Harbour licking the side of the boat had me worried we could be in for a roughie.

On board were experienced coxswains Dave Kerr and Danny Amber and a 27 year veteran pilot named David 'Richo' Richardson. Both Dave and Danny double as coxswains and deckies - roles they alternate between on any given day.

They appeared glad to have me on board and eager to contribute some info for ESR Readers!

Dave explained that we were headed for the Booby Island Boarding Ground where we would drop Richo off on a ship named the 'Superstar Leo'. Due to concerns about the deadly SARS virus, Asia's largest luxury cruise liner - containing 915 crew members - was being diverted from ports in Asia to Cairns where it would be quarantined to ensure it was safe to progress to Sydney and pick up passengers.

Richo's job once he boarded, as I understood it, would be to pilot the ship safely through the Great Barrier Reef's 'Inner Passage', a treacherous area of reef and fast-shifting sandbanks.

"The journey should last about three days," he explained, "but they look after you okay. I get my own cabin and bathroom and am treated to a range of foreign foods (eg. Burmese, Tai and Indonesian etc.)."

Richo explained that pilots working from T.I. were either taken to the boarding grounds at Booby Island or Goods Island. "The boarding ground selected depends on the depth of the ship, the knowledge of the ship's captain and the wishes of the shipping agency," he said.

"All vessels of 70 metres or more in length, including oil tankers, gas carriers and chemical tankers irrespective of length, entering Torres Strait waters," he went on, "are legally required to use the services of a licensed pilot."

As we pulled away from the wharf, Danny motioned towards Sadies Beach identifying it as the home of the Reef Helicopters' landing pad. He then went on to say that boats weren't the only methods of delivering pilots to ships requiring their expert assistance. In some circumstances, boarding is done via land-down helicopter, but this occurs mostly on big bulk carriers on boarding grounds off Mackay.

When Reef Helicopters are involved in the pilotage, they evidently contact the ship on VHF channel 16, 30-40 minutes before the given ETA. They then QSY to channel 09 in order to give advice on boarding procedures and to discuss any other requirements for the pilotage.

The Waiben boasted an interesting variety of radio and communications equipment that satisfied a number of different purposes.

A neat little VHF ICOM transceiver, model ICM402S, was "used for closer contacts", while a sleek black UHF Motorola Radius M120 was used to communicate with ARP HQ.

A FURUNO GPS and radar were additional safety features on the cabin shelf with a complicated WX board that allowed the coxswain to successfully "work the tides".

Also part of the radio bunker, was a GME Electrophone GR945W sea stereo, which the fellas found ideal for tuning into cricket broadcasts!

Motoring past the picturesque golden beaches and pearl farms of Friday Island at a steady rate of 20 knots, I begged the boys to share some of their most bizarre memories of being ARP veterans. By this stage, we had entered Prince of Wales channel, the ocean now a slurry of swirling whitewash, but fortunately it didn't stop them from sharing a tale or two. When not enjoying his role as coxswain for ARP, Dave loves nothing more than to get out on the offshore reefs chasing monster crayfish or huge pelagics. Sometimes, he can even combine both passions - wetting a line from the decks of the pilot boat when the ETA has been put back, or hanging around for a dive once the ship has left.

Dave strenuously refutes Dan's claims that the 'Waiben' and its pilot were actually late to the Goods Island Boarding Ground one day because he was too busy ripping into a school of Spanish macks!!!

Even if the fish ARE biting, waiting for ships tens of nautical miles from land can be a dangerous pastime indeed, especially given the number of deadly sea snakes in OC-138 waters and their startling habit of scaling the bow and unexpectedly slithering into the cabin. Especially when you're a pilot sitting on the portable loo!!!

One of the most bizarre happenings seen by this crew, however, was retold by Danny who tells of his experience with two illegal Taiwanese fishing trawlers dragging a long net between them just north-west of Badu Island. Upon seeing Danny's boat approaching in the distance, one of the trawlers made a sudden panicked detour but found itself smashing into submerged reef where it quickly began to take on water.

Fearing legal ramifications for their presence in Australian Waters, the other fishing trawler dropped the net into the sea and motored off.

A Papua New Guinea Navy Boat had been tracking the two vessels for a lengthy period of time, however, and rounded the other trawler up as it neared Coconut Island in the Strait's far east.

Apparently, the crews were then detained at Port Moresby where they faced the serious charge of fishing in Australian waters. A charge which can carry $100,000 fines for vessel owners and a lengthy jail sentence.

Rolling past Booby Island, home of the world heritage listed AUS-011 lighthouse and the endangered Booby Bird, to say I was anxious about the state of the WX would have been a gross understatement. 100 knot winds were tearing long hissing streamers of spray from 4m high foam capped mountains and the words "ho boy, we're gonna' die!" (or something such) were uttered from my lips on numerous occasions.

Richo and the crew, however, appeared as cool as giant Torres Strait clams as the Waiben was tossed around like a blow up sex toy in the foaming Coral Sea washing machine. According to the Australian Bureau of Meteorology's WX broadcast on VHF radio at 6.30am, we had "nothing to worry about!"

As we neared the 'Superstar Leo', the ship's captain radioed to the pilot boat on Channel 6 VHF to triple confirm boarding time. Dave described how ship captains can get a bit narky knowing they're down to one metre's depth in water below the keel. "I can understand why□," he said. "But that's the nature of sea travel in the Torres Strait - it's bloody scary!!!"

Having never seen a luxury ocean-liner up close before, I was gobsmacked at its ENORMOUS size! With water rushing along its 268metre long sides at an incredible rate, Dave did his best to steady the Waiben alongside the almighty 13 deck, 76,800 ton beast, while Danny, wearing a safety vest and harness, manoeuvred Richo towards a rope ladder that had been dropped from the decks of the ship by waving members of its Malaysian crew.

In the blink of an eye, he had scaled the ladder and was safely on board, leaving Danny to complete the boarding by assisting with the winching up of the veteran reef pilot's luggage.

With the Waiben and its 'green' inhabitant still being thrown about, taking photographs was a hazardous adventure. Hanging outside the cabin with one hand, I managed a few shots, but images of me ending up in the drink prevented me from taking more.

Fortunately, on the way back to Thursday Island, we stayed in the slip stream of the luxury ocean-liner, no more than 15m from its mountain high 32.2m wide stern, which provided us with a significantly smoother ride.

About one and a half hours later, on the edge of the Goods Island Boarding Ground, we were able to leave the ship's wake and bid our farewells to some of the crew that had gathered at the rear of the beautiful ship and head for old TI.

Throughout the journey, I was totally impressed with the crew's conscious regard for safety and of the environment. Dave Kerr, for instance, briefed me on safety procedures and the whereabouts of safety equipment such as life jackets and a life craft before we left the wharf.

He also explained that the pilot boats were serviced after every 200hours to ensure their reliability at sea and that there was nothing to worry about in the rough WX.

The Australian Reef Pilots Pty Ltd and their highly professional staff were obviously proud of their role in maintaining the economic viability of one of the world's most valuable shipping channels. Being fortunate enough to participate in the pilotage of the luxury ocean-liner 'Superstar Leo' will remain logged in my memory forever and, should a fellow radio enthusiast ever be offered such an opportunity, I would recommend that they grab it with both hands! -Dazza!

THE HISTORY OF PILOTAGE IN OC-138

In 1805, Governor King of VK2 identified 'pilotage' as a means of assisting ships through the Torres Strait (OC-138) region. The isolated route had been identified as an economical necessity for commercial shipping, and concerns were growing over the number of ships being lost to encounters with the tricky off shore reef.

Navigable passages had already been demonstrated by some of history's most famous naval explorers in Luis Torres, James Cook, William Bligh and Matthew Flinders and basic sailing directions soon followed.

Ships from Sydney bound for China, Indonesia or India were the first to take advantage of this new short cut to Asian ports. Despite the availability of simple shipping charts, the confined, reef littered waters and monsoonal WX made navigation for sailing ships a perilous activity. In fact, the rust-encrusted wrecks of many of these shipping pioneers are still visible off Goods, Hammond and Entrance Island.

In what is generally regarded as the first 'reef piloting' to take place in OC-138, a VK4 Government mail service was piloted through the northern passage of the Great Barrier Reef by naval officers, in 1865.

Further emphasising the growing acceptance of the need for a safe passage through OC-138, the Australian Government established a base on Waiben Island (Thursday Island) in 1877.

In 1884, the Marine Board of Queensland introduced regulations for the operation of a coastal pilot service. They dealt with licensing issues, pilot qualifications, pilotage fees, and other related matters.

On 5th August that same year, six pilot licenses were granted. These men were the first of their profession - the forerunners of more than 120 in the ensuing century.

In October 1991, 'compulsory pilotage' was proclaimed for the Inner Route between Cairns and Cape York, and also for Hydrographers Passage off Mackay.

All vessels of 70 metres length and over, and all carriers and chemical tankers, were now required to employ a pilot in the specified compulsory district.

In 1993, the Federal Government deregulated VK4 coastal pilotage, enabling competitive organisations to offer their services to shipping agents. The bulk of the licensed pilots formed the 'Queensland Coast and Torres Strait Pilots' Association' which later restructured to form 'The Australian Reef Pilots'.

More information of The Australian Reef Pilots and their role in maritime safety can found by visiting the ARP website at http://www.reefpilots.com.au

DX Diary

by Jack Haden
VK2GJH
(HF, 50MHz & IOTA news)
dxdiary@esr-mag.com

The CQ Magazine (USA) sponsored "CQ World Wide SSB Contest" conducted over the 25th and 26th of October will see the HF bands erupt into a flurry of activity. This will present avid DXers a chance to seek out the odd new country or two. As with each major contest there will be some big signals about the bands from radio amateurs, who take their contesting seriously, with big power coupled to monster antenna arrays, competition will be fierce.

Back in August, the bands burst into activity with the Rememberance Day Contest, the SEANET Contest and the Lighthouse Contest over the weekend of the 16th and 17th. There were many VK's and ZL's on 40m, a usually dead band, chasing RD or SEANET contacts. I tuned into VK5AY and VK2CZ who were both quite keen and working hard to keep the momentum going.

The NSW coast was battered by a severe storm on Sunday 24th Aug, which caused extensive damage. Some districts were declared natural disaster areas and SES volunteers were stretched to the limit on literally thousands of call outs. I was speaking to Ted VK2ARA, who was one of many radio amateurs who had antenna systems damaged by the huge winds with some of his VHF antennas totally wrecked. Not to mention being without electricity for three days, as mentioned by John VK2ZUH near Nowra. I'm sure we all extend our sympathy to those who suffered during this tempest.

ACA PAPER...

The recent release of the ACA document covering the proposed changes to the structure of the amateur radio service in Australia is a must read for all amateurs. The document is around 50 or so pages and can be downloaded from the ACA web site as a PDF file.

Already there is much criticism from many radio amateurs who have very strong views on many of the submissions. Topics include, changes to the licence category (amalgamation of some licence classes), dealing with interference complaints, reciprocal licensing, annual fees and examinations etc. I would strongly encourage every radio amateur to read this paper as it concerns the future of the hobby for all of us. The ACA invites comments on the paper from individuals, as well as clubs etc.

ANZA NET...

The Australian, New Zealand and African Net operates daily with the first stage of the net taking place on 21.205MHz between 0445z and 0500z. If 15m is dormant the second stage of the ANZA Net starts on 14.183MHz plus or minus interference. This net has been running more years than I can remember with some often-exotic calls checking in from time to time.

Originally formed by Percy VK3PA, later moving to QLD, and becoming VK4CPA, (sadly Percy is now a silent key) the net is still going strong. The net controller is either a VK or ZL with a number of able assistants on hand to relay information if need be.

BRAZIL DX NET...

The Brazil DX Nets meets every Saturday and Sunday from 1800 to 2000z on 14.222MHz. Usually, it's run by Daniel PT7BI. This net presents a splendid opportunity for those chasing the various South American countries and districts for award purposes, although it may be a little too early for VK's both time and propagation wise.

CORAL COAST NET...

This net operates every morning on 7.060MHz, with check in commencing around 2030z, starting with the VK4's and then moving across to other states from around 2130z.

Sometimes referred to as the Early Risers Net, this is quite a breezy net with many regulars checking in every morning (I counted 35 on one Tuesday in August). The net controller is quite often Gordon VK4GBW; then it moves to Frank VK2FJW, who looks after those south of the QLD boarder.

CDXC AWARD 2003...

The UK based Chiltern DX Club has awarded Tex Izumo 9M2TO, of Penang (West Malaysia), the prestigious "Local Heroes Award" for 2003. This annual award is presented to an operator resident in a DX country who has contributed a high standard of excellence to the DX community.

The operator must also present excellence in operating without the benefit of major sponsorship. Tex was bestowed the award by CDXC in recognition of the many contacts and confirmations with radio amateurs world wide on bands 160-6 metres over many years.

Many VK six-metre enthusiasts worked their first 9M2 on 50MHz through Tex 9M2TO, who also maintains the Penang beacon on six.

DX HOLIDAYS?

Planning your next DXpedition may be a little easier thanks to a special site on the internet especially dedicated to DX holidays.

Visit http://www.holiday.com, which holds quite a bit of exotic destination information, especially hotels and resorts that are amateur radio friendly. The site may not be bursting with colour or whiz-bang fancy styles but it serves its purpose quite well. There's also some interesting links attached to the site too.

DXCC APPROVALS...

News from Bill Moore NC1L, ARRL DX Manager, advises that the recent Palestine operation E4/DF3EC 07-10th Aug has been accepted for DXCC credit.

MARCONI SPECIAL EVENT...

Although this event has now passed, it's still worth mentioning, as it's now an annual activity.

A special event station signing as GB5FI, from historic Flatholm Island, was active 22-27th August. Flatholm Island was the site where Marconi demonstrated to the British Post Office officials that his theory that radio waves could travel across water. Proving the theory, Marconi established a radio link from Lavernock Point in South Wales, to Flatholm Island, in the Bristol Channel, on 13th May 1897.

To acknowledge this historic achievement, the Barry Amateur Radio Society (South Wales) erected a monument on Flatholm Island, and each year make an annual visit to the island to operate special event station GB5FI.

All HF bands and modes are used plus AO-40 and Oscar-14. A special QSL card has been produced, QSL via GW0ANA bureau or direct.

PACIFIC INTER ISLAND NET...

This net was formed just after WW-II and has been running ever since, although not as popular as it once was. The net meets on 14.315MHz at 0800z daily as a roll call net where stations in the Pacific meet, then usually pair off to a vacant frequency.

Originally, the net was a traffic net, in the days before the internet, and reliable telephone, telegram and FAX services when the islands were more isolated from the outside world than they are today. Telephone patches, weather reports and general "coconut wireless" gossip was the banter of the past, when amateur radio played a key part in island communications.

Now, with the majority of island nations having good reliable communications the net has lost a little of its shine. The net controller is usually an island station, often in KH0, KH6 or 3D2 or sometimes, a VK/ZL.

PACIFIC TOUR...

Two Americans, Tom K7ZZ and Jim W7UG will visit Palau and Yap, in the FSM, starting in early October. The first stop is Palau where they will sign as T88ZX, then on to Yap in the Federated States of Micronesia, to sign as V63ZT for about a week stay. Don't expect a big signal though, the pair are going to run just 100 watts to some verticals from each location. They may visit some other places along the way if time permits. QSL both calls to K7ZZ.

QSLING VIA VK4AAR...

Alan VK4AAR advises that he's handling cards for the following callsigns: 9V1DX, C21RH, C21SIX, KH2VM, P29RH, V63PD, VI0ANARE, VK0MM, VK8AN, VK8DP, VK8RH, VK8XC, ZK2JJ and ZK2PJ.

Alan also looks after some IOTA stations, they are: VK6BM (OC-234), VK6BSI (OC-243), VK8AN/6 (OC-154), VK8AN/8 (OC-229), VK8AV/3 (OC-136) and VK8MI (OC-173). QSLing with Alan is direct only with a stamped self-addressed envelope and sufficient funds to cover return postage. Alan does not handle bureau cards, QSL via PO Box 421, Gatton 4343, QLD.

RADIO DROPS, HL TO P5...

Reading the Monday 25th August edition of the Sydney Morning Herald I noted a piece on where volunteers in South Korean would launch small radio receivers attached to balloons to drift across the demilitarised zone into North Korea. Cathy Hong, writing in Village Voice said volunteers would unleash hundreds of balloons bearing battery-powered radios that would drift across the DMZ.

Each will carry at least one bubble wrapped radio receiver able to pick up Radio Free Asia, Voice of America, a South Korean Christian station and a South Korean government station. A Korean-American pastor, Douglas Shin, and a German physician, Norbert Vollersten, are reportedly the organisers.

However, they expect few of the radios to fall into the intended hands. Hong said "If the winds change the balloons could get blown out to sea, or the radios could break once they hit the ground.

Worse, if people are caught with the radios, they could end up in prison camp or executed."

SILENT KEY...

One of North Americas DXing high achievers has sadly passed away on 12th August. Dick Brown W5AA endured a short, but severe battle with cancer. Dick had the very unique honour of holding three 5-band DXCC plaques from three different callsigns, W0EXD/4, W5AA/8 and YB0ABV. A retired USAF officer, Dick had Doctoral Degrees in Veterinarian Medicine and Pathology.

Dick was very popular and no doubt he will be greatly missed by his many friends in the DX world.

SOUTHERN CROSS DX NET...

This net has been operating for many years on 14.226.5MHz, it was previously known as the "W7PHO Family Hour Net" a number of years back. The Southern Cross DX Net is primarily a DX meeting point and commences around 1130z daily.

This net often runs for many hours, depending on the propagation paths and the amount of DX checked in. DX news and QSL route information is often exchanged during the net. The net controllers are usually based in the USA and the Pacific, with a VK or ZL assisting on most nights.

UN HQ BAGHDAD ATTACK...

Ghis YI/ON5NT was slightly injured in the bomb attack against the UN headquarters, at the Canal Hotel, in Baghdad on 19th Aug. He left for Amman, Jordan to take up duties at the UN office there. Michael YI/PA5M also received minor injuries to his arms and legs in the attack and was repatriated to Germany and is expected to make a full recovery. Peter YI/ON6TT was not in Baghdad at the time of the attack.

4W DXCC STATUS...

The ARRL Awards Committee has announced that despite all of the hype and controversy, (that resulted from the WA2MOE petition seeking to remove 4W-UNTAET from the DXCC list, and adding 4W-Timor Leste as an entity), a decision has been made. There will be no change to the DXCC status of 4W East Timor, now officially known as Timor Leste.

The only change as far as the Committee was concerned was the countries change of name from East Timor to Timor Leste, and this has been accepted. All 4W operations, both past and present, that have been accepted by the ARRL still count.

17M WIDE OPEN...

The 17 metre band has been very active with a large number of DX calls heard, this band becomes very lively so it pays to keep an eye on the WARC bands too.

The other weekend I logged the following, the majority on CW, with some on SSB: 3B8FG, 4S7BRG, 4U1ITU, 4X1MK, 7Q7HB, 8R1Z, 9A4A, 9H3EQ, 9N7AS, CO8LY, D88S (Antarctica), EA6NP, EK2AA, EK3AA, EMIU (Antarctica), GB2ELH, H44VV, HI3Y, JD1YAB (Ogasawara) KG4DP, KL7J, PJ6/I4ALU, RJK1A, SV2AVP (Mount Athos), T94DO, TK/F6MWJ, TZ6RD, UT2FA, V44KJ, VP9BO, VR2UW, V73T, XU7ACW, YI/ON5NT, ZK1TTT, ZV7AA plus numerous USA, UK and Asian stations.

50MHz SNIPPETS...

Six is starting to come to life once again, and thus, there are more operators appearing on 50.110MHz trying their luck. Although the peak of the solar cycle has now passed, there will still be some good DX paths on six, especially during our summer time. John VK4FNQ (QG-39) at Charters Towers reports working, or hearing, JA, HL5 and BG9 (0600-1100z) during mid to late August, this path has often extended into northern VK2.

The NSW division of the WIA is currently considering the future of the VHF and UHF beacons operating from the VK2 division transmitter site at Dural (QF-56), in northwestern Sydney.

Tim Mills VK2ZTM informed me recently that all the beacons are presently under review as they consume the majority of electricity costs at Dural. Beacon reports are being sought by Tim to evaluate their long-term viability.

If insufficient response or encouragement is received then some of the beacons may be switched off. Reports can be sent to Tim Mills VK2ZTM via the WIA web site contact points.

Six metre FM enthusiasts may like to try accessing the Goulburn repeater VK2RGN (QF-45) on 53.700MHz, with an input of 52.700MHz. Radio amateurs on the NSW south coast and around Canberra should be able to access it, as well as those in the Southern Highlands of NSW. Thanks to Chris VK2XCD (QF-45) in Goulburn for this information.

Dan H40V (RH-29) was worked on numerous occasions by JA and KG6 on 50MHz CW during mid August, operating from the Temotu Group. No mention of any VK4's making it across though.

QSL cards go to Dan JA1PBV. As I write, Vladimir H40VV (RH-29) is also very active, albeit on the HF bands though and attracting decent sized pile-ups in the process.

Prominent and well heard UK beacon GB3RMK (IO-77) is back on air after a lengthy down period where extensive maintenance was performed. This beacon, at Mount Inverness, has delivered more or less continual service to the six-metre band for nearly 18 years. The beacon is on 50.060MHz with 40 watts to a dipole in a north/south configuration.

Bermuda has a new six-metre beacon with Chris W3CMP finishing the VP9DUB (FM-72) beacon project in August.

The beacon is on 50.027MHz with 25 watts to a horizontal loop atop a 75-foot mast with panoramic island and ocean views. However, on the 17th Aug the beacon was reported by many as being on 50.025MHz, two kilohertz off the assigned frequency.

There are some Asian beacons to note for the up coming season. BV2FG (PL-0?) in Taipei, Taiwan, has been heard from time to time on 50.000.4MHz CW. It's not clear as to whether this is a test or a permanent beacon. BX2AB (PL-05) at Port Keelung in Taiwan is up and running once again after a long period off air, 50.001MHz with 10 watts CW to a omni G/P transmitting 24 hours. The Philippine beacon DU1EV (PK-04) in Manila, on 50.007.8MHz, is also on 24 hours with 10 watts to a half wave G/P on CW. After a very long absence VR2SIX (OL-72) in Hong Kong is again back on 50.075MHz.

Iraq has a number of stations active on 50MHz; Michael YI/PA5M, Ghis YI/ON5NT and Robert YI/S53R have been very active. The trio were active from the United Nations Headquarters compound in Baghdad, prior to the bomb blast, Grid Square LM-23. There's donated 50MHz equipment on its way to Diya YI1DZ, president of club station YI1BGD. By the time you read this it should be all up and running, adding another Iraq station to six metres. The Canadian Six Metre Group has established a web site dedicated to all things about six metres and news about six in Canada. Have a look at the new site at it's still being expanded as new information and data becomes available. Submissions to be considered for possible inclusion on the site are sought by Allen VE2QCG via .

DX NOTEBOOK

3B Mauritius. Expect some activity from Will 3B8/ON5AX from Mauritius (AF-049) between 06-15th Nov. The main modes will be SSB and CW on the usual HF bands. QSL to ON5AX.

3B9 Rodriguez. Robert 3B9FR had quite a pile up on his hands on 7.000MHz CW, right on the band edge, around 1555z. Robert has been very active on most HF bands in recent weeks steadily eroding demand for this semi rare DXCC entity.

3X Guinea. There will be some ongoing activity from John KA5BQM as he takes up a position with the US Embassy in Conakry for the remainder of this year, and possibly longer. John is signing as 3XY8B on the usual HF bands. QSL to home call.

4M Venezuela. Prefix hunters should be on the alert for 4M9YY between 07-12th Oct. The operation will be conducted from San Fernando de Apure, a location in the very rare 9th call district of Venezuela. There will be four operators on the usual HF bands and modes. QSL to 4M9YY, Pakmail-10012, PO Box 025304, Miami 33102-5304, Florida, USA.

4U World Bank. I noted quite a pile up on 14.207MHz the other night with 4U1WB doing battle; the "WB" suffix signifies "World Bank". QSL to KK4HD.

5J San Andres. Some team members of the Florida DX Group will be on San Andres for the CQ WW SSB Contest, held over the 25th and 26th of October. They will be active on all bands and modes as 5J0X. QSL route not supplied.

7Q Malawi. Ongoing activity from Malawi continues on unabated, this time with Harry G0JMU to sign as 7Q7HB until sometime in October. Harry likes the 30m WARC band, so you may have to look for him there. QSL via G0IAS with SAE and return postage, no bureau cards. Ely IN3VZE has also been active as 7Q7CE recently, QSL to his home call.

9G Ghana. Henk PA3AWW has been about the usual DX spots as 9G1AA in his free time. Most of Henk's time is spent working at the Dormaa Hospital. QSL via PA3AWW.

A61 Dubai. There will be a brief five-day operation by Don N1DG, signing as A61AD. The exact dates are not yet confirmed, but the operation should commence around the 05th October. QSL to home call. Bands and modes not yet advised.

BQ9P Pratas. The Chinese Taipei Amateur Radio League planned expedition to Pratas, (mentioned last issue) will take place between 09-16th October. However, there has been no mention of an assigned call sign as yet. The team's been very busy with preparations in the lead up to this big operation; they will be on bands 160-6 metres including the WARC bands. Modes will be SSB, CW, RTTY and SSTV. Participants, as this went to deadline, are BV3BW, BV3FG, BV4FH, DL3DXX, DK7YY, JI6KVR, OE1WHC, UA3VCS and ZL4PO.

C5 The Gambia. There's some planned activity from Holger DL5XAT and Matthias DL5OB between the 21st Oct and 02nd Nov. The duo have yet to secure their local licenses, however, they plan to partake in the CQ WW SSB Contest as a multi-2 entry on the 25th and 26th of Oct. Outside of the contest the majority of operating will occur on CW.

CE0Y Easter Island. Two Polish radio amateurs will visit Easter Island from the 17th Oct to the 01st Nov. They will sign as CE0Y/SP9PT and CE0Y/SP9EVP on bands 80 through to six metres on CW, there may be some activity on RTTY, PSK31 and SSTV. QSL to their home calls.

D9 South Korea. Quite a pile up was observed at 1152z chasing D90HC, on 7.004MHz CW. D90HC was a good 579 here in Sydney at the time. Many in pursuit were American and Pacific prefix hunters.

DU Philippines. Dutch operator PA0CYW will be in the Philippines especially for the CQ WW SSB Contest (25th & 26th Oct) as DU2/PA0CYW in the single operator all band categories. He will commence on the 20th of October, prior to the contest, and shut down around the 01st of Nov. QSL to home call.

E4 Palestine. German radio amateur DF3EC was noted around the prime DX spots during August as E4/DF3EC. However, was closed down by the Israeli authorities in mid August, with his transceiver impounded as "a security risk". QSL to DF3EC.

ER Moldova. A special event station signing as ER27A was active 20-27th Aug celebrating the Independence Day of Moldova. This call was much in demand by the WPX hunters, and was noted on many of the HF bands. QSL to ER1DA, bureau or direct.

FR Reunion. Willy ON5AX plans to visit the island (AF-016) and come on air as FR/ON5AX 20-23rd Oct. The main modes will be SSB and CW, QSL to his home call.

H40 Temotu. Kazuo P29KM was very active on HF during his stay in the Temotu Group signing as H40H. On the 11th August he had a very nice signal into VK2 on the IOTA frequency 28.460MHz around 0100z and had his hands full with a JA and USA pile up. QSL to P29KM. On 24th Aug around 1045z I noted Vladimir H40VB on 10.104MHz CW working a small pile up, QSL route UA4WHX.

HB0 Liechtenstein. Pierre HB9QQ will operate from a mountain (weather permitting) some 2200 metres ASL as HB0HB9QQ from 12th Oct. The majority of activity will be on 160m with 500 watts to a dipole. QSL HB9QQ.

KH7K Kure. Kimo Chun KH7U wishes to advise that the October 2003 operation from Kure Atoll has been cancelled. Owing to some transport irregularities there's been no alternative but to suspend the Kure Atoll operation for the time being. Hopefully, the trip will now take place sometime in 2004; apologies go out to all.

OJ Market Reef. Members of the QLF DX Team were to be active as OJ0LA in the period 19-26th September. Five club members participated along with OH0RJ who went with the team and signed as OJ0RJ. All bands and modes were used.

S6 Singapore. Members of the Singapore Amateur Radio Transmitting Society (SARTS) held a special field day operation from St John Island (AS-019) between 05-06th Sep as S61FD. Special focus was directed towards the low bands 160 and 75 metres, plus the usual HF spots 160-10m. Many WPX collectors would have been after this exotic prefix. QSL to SARTS via the bureau.

S7 Seychelles. There will be some activity from Mahe, Praslin and La Digue Islands (all AF-024) in the Seychelles by

Willy ON5AX as S79AX. Willy plans to participate in the CQ WW SSB DX Contest. Activity will be on the usual HF bands CW and SSB. QSL to ON5AX. Another one to look for is Norbert DL2RNS who will sign as S79NS. The schedule for Norbert is 04-17th Oct, QSL to home call.

S9 Sao Tome. Tom S9TX is back in Sao Tome (AF-023) for a further 12 months. One of his favourite bands is 50MHz, when six is dead he then adjourns to the HF bands. QSL to W7KNT.

UE Asiatic Russia. The Brjanskij Radio Club had two stations on air 160-10m SSB, CW and the digital modes as UE3YGA and UE3YGA/p. The activity took place between 15th Aug and 25th Sep, QSL to RV3YR.

V73 Marshall Islands. Quite a lot of activity has been noted from the Marshall Islands on 40m CW, just the other morning I noted V73NS on 7.004MHz around 2015z. Much earlier, at 1500z there was a good 599 signal from V73GT on 7.002MHz.

VK9X Christmas. Charlie W0YG will sign as VK9XG from Christmas Island from 26th Oct to 09th Nov with the focus on 160 and 80m. The majority of activity will take place on RTTY using an ICOM IC-751A to a Kenwood TL-922 linear linked to two "pennant" antennas. QSL direct only, no bureau, to home call.

YA Afghanistan. Sada YA1D has been mostly active on 15 and 20m SSB recently, he will do CW if requested but is very slow, so be patient. The club callsign of YA0J has been made available for any visiting radio amateurs who may like to operate. QSL both calls to JG1OWV.

ZC Cyprus. There are reports that Geoff ZC4CW has been very active from the UK Sovereign Base on Cyprus in recent weeks. Recent news suggests that the operator of Geoff will be based on the island for the next few years. QSL to G3AB.

ZK1 South Cooks. Two visiting American radio amateurs, Dave W6AQ and Don K6IPV will be in the South Cooks for the CQ WW SSB Contest over the 25th and 26th Oct. They will arrive early on the 20th Oct and depart on the 29th Oct; the callsigns have yet to be announced to date.

IOTA NEWS

Suggested IOTA Frequencies: CW 3.530, 7.030, 10.114, 14.040, 18.098, 21.040, 24.920 and 28.040MHz. SSB frequencies are 3.765, 7.055, 14.260, 18.128, 21.260, 24.950, 28.460 and 28.560MHz.

There's been some new IOTA reference numbers issued during August: AF-093 J5 Guinea Bissau Coastal Region Group (Guinea Bissau), AF-094 7X Mediterranean Sea Coast West Group (Algeria),NA-225/Pr VY0 Nunavut (Prince of Wales & Somerset Island) Group (Canada) and OC-262 YB4-5 Sumatra's Coastal Islands South (Indonesia).

Cho (AS-060). Ongoing activity from DS4BHW will continue on through to 31st Dec. He mainly operates bands 80-6m predominantly SSB. QSL to DS4BHW.

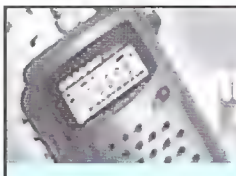
Damas (SA-086). Nine members of the Altacama Desert DX Group will be on air as 3G2D from 17-19th Oct inclusive. The gang will activate bands 160-6m CW, SSB, RTTY and PSK31. They plan to operate three stations on air 24 hours. QSL XQ1IDM.

Falealop (OC-078). Nigel G3TXF was active from Falealop, part of Ulithi Atoll, 29-31st August as V63TXF/p, only on CW running just 100 watts to vertical antennas. Ulithi Atoll is 106 miles northeast of Yap with a collective population of around 900 and consists of 49 small islets. It's also unusual to see the V63 authorities issue three letter suffixes too, maybe a first.

Fox (NA-059). Tim NO7F will be residing on Fox Island until the 31st Dec signing as NO7F/KL7. Tim comes on the air as his free time allows QSL to K8NA.

Grenada (NA-024). Current activity from J3/G4BKI will be ongoing until the 31st Dec 2003. QSL to home call.

Kos (EU-001). There will be some concentrated activity from SV5/DL1ARD, SV5/DK3HQN and SV5/DL5NUA on 10-160m, including the WARC bands. They will be on CW and SSB in the period 24th Sep to 08th Oct. QSL to home calls.



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Phuket (AS-053). On going activity from HS0/IK4RMH will continue until the end of the year. He operates as free time allows. QSL to home call.

Sangihe (OC-210). Local Indonesian radio amateur YC8RRK will continue his activity from Sangihe Island until 31st Dec 2003. QSL YC9BU.

St Johns (NA-106). Members of the Wireless Association of South Hills will visit St Johns in the US Virgin Islands 04-12th Oct and sign as NP2SH. They will be about the bands 80-10m CW and SSB, QSL to N3ZNI.

Taongi Atoll (OC-236). John W5RQ and Buzz N5UR were very active from this new IOTA island as V73T during late August. Taongi is some 36 hours by sea from Kwajalein Atoll and is the most northern atoll of the Marshall Islands in the Ratak (Sunrise) Chain. Taongi is very small, some 1.24 square miles in land area with a 30.12 square mile area lagoon. The island is uninhabited. QSL to N6AWD.

Tiga (OC-133). There was some rather sporadic activity from 9M6KM and 9M6KTC on 20 and 15m from Tiga Island. The activity took place over the 16th and 17th of August. QSL to home calls.

Upper Matecombe Key (NA-062). Brad NL7AU continues to be active and will remain so until 31st Dec 2003. QSL to NL7AU.

Viti Levu (OC-16). There was some operating from Franz ZL2II as 3D2II from 24th Aug to 02nd Sep from the main island of Viti Levu. Franz came on air, 10-40m as time permitted, mainly on CW. QSL to ZL2II.

Yap (OC-012). Two British amateurs, Roger G3SXW and Nigel G3TXF were recently active from Yap Island as V63SXW and V63TXF, mostly on CW. They were active in the period 27th Aug to 03rd Sep, with Nigel heading to Falealop Atoll (OC-78) for a few days.

That's just about it from me until the next issue, contributions to the column are most welcome, and can be sent to my email address featured at the start of the column. Despite the propagation being poor, there's still some rare DX about the bands.

My sincere thanks and gratitude go out to Rocco IK7AFM, Mauro I1JQJ, Karl DL1EK, Carl N4AA, JI6KVR, Hector XE1BEF, Jim VK9NS, Norm VK2ZXC, Tim VK2ZTM, John VK4FNQ, Peter Jenkins (SWL), World Radio, 425 DX News, MDXC, OPDX Bulletin and the JA Cluster.

73's and happy DXing□
Jack VK2GJH.

QSL ROUTES Oct 2003
by Anne-Maree Haden

The QSL routes listed are compiled afresh each month, and thus the call signs listed will not be repeated. The routes listed cover the most recent amateur radio DX, Contest and SES operations. Whilst every effort is made to cross check the data received, the odd error may occur. The information herein is obtained from a variety of sources, in good faith.

3B9ZL	FR5ZL	CN8NK	EA5XX	JW8AW	LA8AW	UE3YGA	RV3YR
3C0A	DJ9ZB	CQ0RLH	CT2GZB	JW8D	LA7QI	V47CA	VE3BW
3C0F	DJ9ZB	CS5C	CT1AHU	K8E	N8MR	V63SXW	G3SXW
3C0R	DJ9ZB	CS5E	CT1CSY	K9Y	N9NT	V63TXF	G3TXF
3C0V	DJ9ZB	CS5F	HB9CRV	KG4CM	N5FTR	V63ZT	K7ZZ
3D2II	ZL2II	CT9D	CS3MAD	KG4DP	WA4ET	V73B	N6AWD
3DA0SV	K4YL	CT9M	CS3MAD	KG4LH	N1WON	V73CW	AC4G
3DA0WC	VA7DX	D44TD	CT1EKF	KH9/N6XIV	K2FF	V73T	N6AWD
3G2D	XQ1IDM	E20HHK	E21EIC	LT1F	AC7DX	VI8NT	VK6NE
3V8SF	DL1BDF	ED6LGH	EA6LP	LZ1KSL	LZ4BU	VK9XAB	G3AB
3V8SI	F5AEG	ED8LPA	EA6AKN	N1L	KB1HJO	VK9XG	W0YG
3V8SQ	DL1BDF	EO12ID	US7IGF	NP2SH	N3ZNI	VP8LGT	VP8ON
3XY1L	UY5XE	ER27A	Bureau	OJ0LA	LA9VDA	W2T	N2OO
3XY8B	KA5BQM	ES8X	ES2RJ	OJ0RJ	OH0RJ	W3I	AE4MK
4D71HBC	DU1HCB	ES9A	ES5RY	P29SI	JA1PBV	W4L	W4DFU
4K0CW	DL6KVA	FM5GU	KU9C	P29VVB	UA4WHX	XF1K	N6AWD
4K0GNY	GM0GNY	GB2ELH	WA7OBH	PQ2C	PY1NEZ	XU7ACT	G3SWH
4U1ITU	Bureau	GB5FI	GW0ANA	PT2C	PY1NEW	XU7ACU	G3SWH
4U1WB	KK4HD	GB5PW	G0CAM	PZ5CQ	KD5CQT	XU7ACW	LA5YJ
5H1F	K1XM	GS2MP/p	N3SL	PZ5FF	K2FF	YI2X	OM3JW
5I3A	Bureau	H40H	P29KM	PZ5UE	W5UE	YI/KV4EB	K0JN
5K8P	HK8RQS	H40V	JA1PBV	S61FD	Bureau	YI/OM2DX	OM3JW
5R8HA	G3SWH	H40VV	UA4WHX	S9TX	W7KNT	YI/S53R	K2PF
6L0NJ/4	DS4AEN	H44V	JA1PBV	SK6LGT	SM5DJZ	Z3100M	Z35M
7P8DA	K4YL	H44VV	UA4WHX	SN0HQ	SP2PI	ZA1A	OH2BH
7Q7NT	G4FAL	HF8IL	SP8PJG	SN28SMS	SP3ZAH	ZC4CW	G3AB
8Q8HX	DJ9HX	HK70AXY	HK3AXY	SV5/SM8C	SM0CMH	ZF2FF	K8FFO
8S6BAS	SK6DW	HK70LR	HK3DDD	T32SC	JA0SC	ZK1KAT	WA4WTG
8S6LGT	SM6PVB	HK70RQS	EA5KB	T5X	DJ6SI	ZK1TOO	WA4WTG
9A7T/p	9A2EU	HL0Y/2	HL0Y	T88HO	JH9URT	ZK1TTT	WA4WTG
9N7AS	JH3PAS	HL2003WCX	DS5XNW	T88ZX	K7ZZ	ZK1USN	K6USN
9Y4TBG	DL4MDO	IQ3TS	IV3LNQ	TA3J/4	TA3J	ZK1ZOO	WA4WTG
A61AD	N1DG	IQ6AN	I6KYL	TF8GX	K1WY	ZM4A	Bureau
B4HQ	BA4RD	J45XB	DJ9XB	TI5N	W3HNK	ZM8CW	ZL1AMO
BN0F	JL1ANP	J49DIA	SV9ANK	TM0HQ	Bureau	ZV7AA	PY7AA
BX8AA	BV8BC	JW6JVA	LA6JVA	TM3XX	F6DBA		
C6AMK	N8IK	JW7QI	LA7QI	TM5T	ON4GO		

NCRG
The
Northern Corridor
Radio Group
is holding it's annual
Hamfest on at 9.30am
November 2nd 2003
at the
Cyril Jackson
Community Centre,
Fisher St
Bassendean. WA
Entry is just $5 at the door.
All the usual suppliers and
a few new ones will be in
attendance.
Its a great place to catch up
with old friends and a time
to make new ones.

VK-Tasman Contest Winner (Phone) - Alan VK4SN

from Bruce Renn vktasman@hotmail.com

I was first licenced in 1984 and changed callsigns as I moved around Australia with the RAAF as a Signals Operator.

This coupled with the fact that my Grandfather was a keen operator took me to take up AR. VK4SN was first licenced in 1938 by my Grandfather, then was passed to me after he was called to higher service in 1991. (Tribute on my web site).

I was introduced to contesting when the Northern Corridor Radio Group (VK6ANC) was formed in the mid eighties.

After moving back to VK4 in 1990, I have enjoyed many contests, most recently with the Lockyer Valley Radio and Electronics Club Inc (VK4□IL) in international contests and personally in VK□□Icontests. (□ou may also get heaps of info off my web pages www.□sl.net□ vk4sn.)

□ope that fills a gap in the mag... hi hi..

Once again, many thanks.

Alan VK4SN

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11m DX Group 'Calendar of Events'

from Darren Johnston dazza@esr-mag.com

If your 11m DX group has an event, contest, meeting, deadline etc. that you would like listed in ESR's Calendar of Events, please email Darren Johnston on dazza@esr-mag.com with details.

October 3	Delta Radio's World Castle Day (WCD) commences Sugar Delta World Meeting, Madrid Spain
October 4	Delta Tango 'Big Weekend', Ipswich, Qld Delta Tango Club station active as 43DT000
October 5	World Castle Day finishes
October 17	International Radio Group's World Meeting, Blue Birds Baseball Club, Amsterdam
October 18	Jamboree On The Air (JOTA) on both amateur and 27MHz bands
October 19	Sugar Delta World IOTA (Islands On The Air) Month commences
October 23	General Meeting for the Omega Radio Club, Venue TBA
October 31	Delta Tango Group membership renewal due
November 1	Two year anniversary of Delta X-ray Radio Group
November 18	Sugar Delta IOTA Month concludes
November 29	Mountain Radio Challenge (MCR)
November 30	Logs due for Lima Delta European Contest
December 15	WCD logs due
December 18	Logs due for Sugar Delta World IOTA Month
January 1	Delta Tango World Contest commences

27MHz DX-Report

The 27 MHz DXer
by Jack Haden VK2GJH
27dx@esr-mag.com

Things are slowly starting to pick up on 27MHz, albeit in leaps and bounds. There's quite a bit of SSTV and PSK31 activity on 27MHz too, with a regular group noted about the traps, usually on the weekends.

Most of the news this month comes from Tom 43-TT-05 in the far north of Western Australia, and Sandra 43-SN-010 in far northern QLD, both have been very active on the band. Tom runs two stacked five element beams co-phased on a 60-foot high tower that used to belong to the local taxi company.

Hopefully, by the time you read this, propagation will be on the move for the better. It was a very quiet winter, especially for those in the southern states. If it wasn't for the notes sent by contributors in the northern states there would have been no column for this issue. DXpedition activity has dropped off too in recent weeks, it should pick up again as conditions improve.

Quite a number of CBers along coastal NSW suffered antenna damage from the severe winds that battered the coast on Sunday 24th August. I heard a few people on the channels talking about damage, many reported vertical base antennas bent at the top.

DX VISITOR...

It was nice to catch up with Guy 172-GD-01 from Tontouta, in New Caledonia during late August when he and his wife passed through Sydney. Guy spent a week in Sydney before heading to Paris to see his parents.

We exchanged quite a bit of radio gossip and it was nice to hear things about 27MHz from a New Caledonian perspective over a beer and a meal at the NSW Bowlers Club in the city. Guy mentioned that many have given up CB radio in New Caledonia in the past five years, Guy works as a Gendarme at La Tonouta international airport.

MOUNT ATHOS (254)

There was a great pile up of voices, mostly barely audible, from Europe and Asia, chasing 254-ST/0 on 18th Aug around 1000z. I couldn't hear very much of the Mount Athos station due to the total chaotic mess that the channel was in at the time.

Some were saying that it may have been a hoax, whilst others said it was for real, a dollar each way? QSL via Max 1-ST-174 at PO Box 5, Quarto, Napoli 80010, Italy.

NORTH AMERICAN DX...

Derrick 43-LR-001 reports quite a bit of activity from Canada and the USA as the band starts to pick up during Spring. Whilst most signals from Canada and the USA are predominantly from the West Coast it's better than nothing at all. There have been a couple of Canadian IOTA stations about for those who pursue the IOTA programme.

SILENT KEY...

Sad news circulated quickly in Europe with the announcement that well known Spanish DXer, and active contester, Manuel 30-AT-206 had passed away on April 18th. It wasn't until late July that the news was released due to many people reporting that they hadn't heard Manuel on air for some time, most thought he was away on vacation. Manuel was always a good signal into the Pacific from his home at Alicante and will be missed by the many friends he made on the radio. (News from Juan 30-AT-020)

SILENT KEY...

A brief announcement from Panos 18-AT-142, in Athens, advises the DX community of the passing of Panos 18-AT-115. Panos was quite active from his home at Halandri, a suburb of Athens and was taking a holiday on Paros Island when he passed away.

182-IR/0 REPORT...

Two French DXers, Willy 14-IR-707 and Florent 14-IR-206 went on a DXpedition to the Guinea Republic back in early March to operate from the capital, Conakry, and Kassa Island (AF-051) for the IOTA side of the trip. Conakry is a six hour flight from Paris and upon arrival found the airport terminal to be in a chaotic state.

The airport was overrun with touts, currency sharks, picket pockets and other undesirables after a quick dollar or two. The national language is French, although many African tribal languages are also spoken with French as the common communication language.

The Guinea Republic is one of the poorest countries in West Africa with basic public utilities, such as water, electricity and telephones subject to frequent, and often prolonged, disruption.

The population is around seven million. A former French colony from 1890, independence was gained in 1958; the national literacy rate is only 35.9 percent.

Military conscription is compulsory for all young males. The national crime rate increased by 20 percent in the last five years, corruption is endemic.

After exiting the airport the pair arrived at their hotel and immediately assembled the radio gear, an ICOM IC-706 MK-IIG into a half-wave dipole antenna. Disappointment arrived quickly when it was found that 27MHz was void of any decent propagation.

Power cuts meant that on air operating time was more or less restricted to two hours in the morning, around one or two hours at noon and some hours in the evening. Private generators were scarce as hen's teeth as only the privileged few had them.

Many commercial buildings in the city had wire communications antennas on their rooftops, suggesting the unreliability of the internet and the telephone system. The Sierra Leone Embassy has a huge log periodic antenna in its courtyard, the lads wished they had access to that□

Due to the power outages Willy and Florent had ample time to take in the sights in and around Conakry, best done during the day, many parts of Conakry are unsafe for foreigners at night. Progress was made when the power was on during their second day (03rd March) with the first contact going to Regis 14-IR-107 in France at 0845z, after that many Europeans were worked and a pile up quickly ensued.

Even though the dipole was mounted under a balcony on six feet above the ground a steady stream of contacts filled the log. This came to an end when the power went off at 0930z, during this down time it was decided to replace the dipole with a home made square loop cubicle quad.

With the small quad signals improved dramatically, only 455 contacts were made on the first day, by Thursday 06th March some 1795 stations had been worked in total. Many more would have been worked if the electricity supply had been consistent. That night the station was packed away, ready for the Friday trip by boat to Kassa Island to sign as 182-IR/AF-051, a one hours sail from Conakry. The hotel on Kassa Island was very nice and well presented, although problems still existed with the electricity supplies once again, disrupting operating times.

By 1334z on 07th March 182-IR/AF-051 was on air with first contact going to 14-IR-174, and by Sunday 09th March some 865 stations were in the log. Poor propagation didn't help the situation either, again it was time to close up shop and move back to Conakry. Meanwhile, demonstrations and riots had broken out across the entire country due to a sudden 25 percent increase in the price of petrol.

Arriving back at Conakry they were greeted with various forms of civil unrest, and after an arduous taxi journey, arrived back at the hotel. Willy and Florent received a better room this time and mounted the dipole in a palm tree; this was linked to the spare radio, a Kenwood TS-50s.

From 1635z on they were back on air as 182-IR/0 once again working 14-SD-214 as the first contact in the third, and final leg, of their tour. Propagation was utterly poor with progress so slow that many contacts were made on simplex, as split was not needed with a small contact rate.

Meanwhile, the government had placed armed soldiers around the hotel for protection and informed guests not to leave the confines of the hotel for their own personal safety. Gunshots were heard often, both during the day and at night. The pair closed down on the 13th of March disappointed with the poor propagation, with 1875 contacts in all to 62 DXCC entities for 182-IR/0.

The figures for the IOTA trip as 182-IR/AF-051 Kassa Island were not much better with some 865 contacts to 53 DXCC entities. Only one contact was made with Oceania, and that was with 172-AT-101, also only one was made with Asia, to 97-SD-101. QSL cards for this operation have been out for some time now and are quite attractive colour productions.

Disclaimer: All times are published in the UTC/GMT format. QSL routes and IOTA designators are provided where known. Information is derived from a number of sources in good faith and could possibly contain some errors beyond my control.

Neither this periodical, nor myself, will not be held accountable for any radio operators failing to comply with the Australian Communications Authority rules and regulations governing the Citizens Radio Service, and its by-laws.

World DX Forum

The Pacific...

Easter Island was mentioned in the last issue, however, the dates of the operation changed just after the deadline had passed. Now, 144-FRI/0 is scheduled to appear in the period 01-30th Sep, so it may have passed by the time you read this. QSL to PO Box 2, Chassieu-Cedex 69682, France.

Palau has been about with Sandra 43-SN-010 reporting activity from Jun 134-JR-02 from the capital Koror, usually around 2300z onwards.

Jun is a Japanese chef at one of the big tourist resorts just out of Koror and gets on the radio to talk to his mates back in Yokohama, Japan; his English is not too bad Sandra reports.

Papua New Guinea belted in a good 5x9 plus with Peter 43-FP-103 when he linked up with Guilder using the novelty call of "Highland Radio" at 0300z. Guilder, a German national, is located in the Central Highlands of PNG and works with a missionary bible society performing voluntary work.

Samoa made an appearance with Sione using the callsign "Coconut Wireless" at 0256z when he worked Peter 43-FP-103. Peter said "Sione was a good 5x6 at the time and was using an old Pearce-Simpson 23 channel Super Panther fed to an old MK-I Station Master.

Sione wasn't interested in QSL cards, just a friendly chat from his home on Savaii Island. The radio was obtained from his brother who lives in American Samoa."

The **Solomon Islands** has been about with at least two or three Australian voices noted on the band in recent weeks. At 0100z Peter 43-FP-103 reported a quick contact with Nigel signing as 135-Happy Isles and a good 5x7 report too. Nigel is in Honiara connected with an Australian company on a government contract.

Sandra 43-SN-010 also reports that she worked Keith with the novelty call of Radio-One at 2359z who is also in, or near, Honiara. Keith wouldn't elaborate too much on what he was up to there.

The **South Cook Islands** was noted at 0245z with Pele using the short call sign "Radio Cooks" heard calling for "New Zealand stations in the Auckland area only" the other day.

Maybe he was looking for someone to make a telephone call to a relative on his behalf. There's a large Cook Islander population in Auckland.

Tonga came through a good 5x7 at 0400z with Albert 2-MM-01/96 maritime mobile on a yacht anchored in the lagoon at Vavau. Albert has been in Tonga for seven months and plans to move on to Fiji very soon.

Vanuatu appeared around 0455z with 197-VLI operated by Kazu a good 5x6 in Sydney. Kazu is in Port Vila with a Japanese company on business for six weeks.

His main interest appears to be in keeping contact with his mates back in Japan. Kazu is not interested in DXing generally, and doesn't exchange QSL cards.

Europe...

The **Aland Islands** was noted at 0856z with 212-LR/0 working Sema 91-JK-10 in Indonesia at the time. Signals were very poor with only bits and pieces heard from the Aland Island station above the static and other noise. QSL route not known.

Andorra attracted a number of Asian stations around 1030z with them chasing after Toni 51/30-SD-027. Only bits and pieces of the Andorra station could be heard, insufficient for a decent two way contact to take place.

The **Azores Islands** made the logbook of Peter 43-FP-103 when he linked up briefly with 75-SD/EU-175, an IOTA operation, at 0756z. Conditions were very poor and contact was soon lost even before the basic formalities were exchanged.

The **Balearic Islands** came through a good 5x3 at 0900z with 49/1-LR-017 calling for the Pacific. However, his call went unanswered and he then picked up a couple of Indian Ocean stations that responded.

Bosnia-Hercegovina surged above the general rabble of Western Europe with 331-SD-101 linking up with Tom 43-TT-05 at 1400z, a fair 5x3 report. Not long after, at 1412z Tom also worked Marco 331/1-AT-1971 exchanging 5x4 reports both ways.

The **Czech Republic** was just audible above the noise the other evening with Tom 43-TT-05 reporting 329-SD-102 a very weak 3x2 around 0910z.

One minute he was there, and the next, he was gone. Also active about the band Tom noted was 329-JR-02, 329-CBS-02 and 329/13-DX-056 at varying signal strengths.

Guernsey Island made the log of Sandra 43-SN-010 when she heard Phil 169-AT-011 answer her call at 1045z. Although a just readable 3x2 report it was better than nothing. QSL via PO Box 364, Guernsey GYI-3YG, UK.

The **Isle of Man** faded in and out of the noise around 1000z with Peter 43-FP-103 hearing 137-ED/GT looking for contacts outside of Europe.

Latvia surged through the static around 0855z with Henry 310-CS-03 calling for the Pacific and Australia. Henry was only a 3x3 at best and was responded to by a New Caledonian station.

Liechtenstein has been quite active with Jackie 40-VD/0 noted about the band on numerous occasions. QSL to PO Box 21, Chef-Boutonne 79110, France.

Luxembourg came through very weak at 0955z with Heinz 54-SD-001 heard working a station in the Middle East. Heinz was a barely readable 3x2 report at the time. Tom 43-TT-05 worked 54-AT-109 at 1030z 5x3 report.

Malta made the log of Gazza 43-PR-666 (camped at Pine Creek in the Northern Territory) at 0955z when he logged 93-AT-030 exchanging a 5x7 report. Gazza also noted 93-GZ-010 and 93-MC-002 around the same time. Tom 43-TT-05 reports that he worked 93-SD-010 around 1245z 3x3 report.

Rhodes has been about the usual DX spots with 59-RH/DX making the log of Gazza 43-PR-666 at 1055z. Gazza recalls hearing this station on a number of occasions just up from the calling channel.

The **Slovak Republic** by way of Tom 330-AT-112 was heard at 0950z with a weak 4x2 report. A couple of Sydney stations appeared from nowhere and quickly gave chase but with no result. QSL Tom via PO Box 41, Sobrance 07301, Slovak Republic. Tom 43-TT-05 had a quick contact with 330-AT-112 much later at 1355z exchanging a 5x3 report.

Slovenia made the log of Tom 43-TT-05 at 1402z when he secured a quick contact with Bok 327-AT-135. Bok was a weak but readable 4x3 report at the time. QSL to PO Box 1022, Maribor 2001, Slovenia.

The **Ukraine** surged out of a relatively dead band with a good 5x7 signal from 315-SD/ID at 1000z the other night. However, by 1004z the show was over with 315-SD/ID fading out as quickly as he appeared.

Africa & Indian Ocean...

The **Canary Islands** has a regular presence on the band and Tom 43-TT-05 nabbed 34-SD-123 and Jon 34-SD-127 around 0500z with the average report being 5x3.

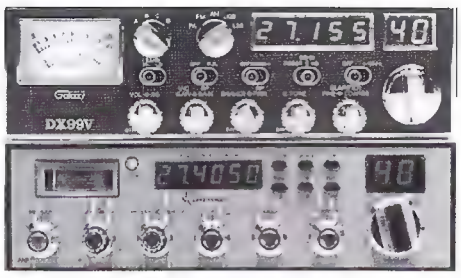
The **Cape Verde Islands** popped up from the noise at 0708z with Rafael 205-AT-102 a weak, but readable, 3x4 report. Sandra 43-SN-010 quickly nabbed Rafael and exchanged a quick report with him. QSL via PO Box 116, Mindelo, Sao Vincente Islands.

Ceuta & Melilla have been quite popular with quite a number of stations mentioned on air from this tiny Spanish enclave at the tip of North Africa. Peter 43-FP-103 reports hearing 106-SD/RMC a weak 3x2 at 0600z and Fernando 106-AT-106 4x2 about 20 minutes after.

Malawi appeared around 0745z with a very weak 3x2 signal from Sigfrido 226-AT-101who was calling for the Pacific at the time.

A northern Queensland station soon latched on to him at exchanged a quick report and basic pleasantries. QSL via PO Box 40, Santa Lucia Del Mela (ME) 98046, Italy.

Marion Island will be about the usual DX traps with Shaun 256-SD-101 on the island until 30th Apr 2004. DXCC wise, this is referred to as Prince Edward & Marion Island. QSL to 14-SD-036.



Morocco has been quite active with Renato 76/161-SD-216 worked by many in Europe over recent weeks. The actual details of this operation are not known at the present time. Tom 43-TT-05 worked 76/30-KP-016 at 1322z with a 5x6 report exchanged between them.

Reunion Island crept out of the noise on a rather quiet band with 173-SD-105 a fair 5x3 at 0715z. He was calling for New Caledonia and didn't appear all that interested in the two Australian stations that called him a number of times. Cyril 173-AT-127 has also been active in the afternoon with quite a good signal.

Sierra Leone surprised Tom 43-TT-05 at 1023z when 65-AT-101 who was a very weak 4x1 at the time answered his "CQ" call. Tom said "I was quite lucky as there was no interference from Indonesia at the time, otherwise I would have lost him. Sierra Leone is a new one for me so I am really tickled about that contact." QSL to PO Box 21, Pofi-FR 03026, Italy.

South Africa pushed the needle up to a good 5x5 report with 44-SD-111 worked by Sandra 43-SN-010 at 0600z. Sandra also bagged 44-SD-106 and 44-WDC-001 not so long after, although they faded out quickly.

Asia/Middle East...

Armenia was noted around 0750z with 301-LR/0 calling for the Pacific; he was about 5x2 peaking five at the time.

Iran came through the noise at 0855z with a faint, but audible, signal heard from 154-TRC/DX the other night. There was a large number of European and Asians in hot pursuit at the time, with the pile up on the verge on collapse.

Israel copped some deliberate interference when Peter 43-FP-103 tried to work 97-SD/DX at 0948z the other night. After trying for around five minutes Peter had no alternative but to give it away, the Israeli station was on the receiving end of some very heavy jamming.

Saudi Arabia caught Tom 43-TT-05 by surprise at 1304z when he worked 48-SD/0 a good 5x6 report. Tom wasn't too sure if someone was pulling his leg or not, work now and worry later. Tom then heard a very weak 48-SD-010 at 1345z 3x2, Tom tried to work him but couldn't get him out of the noise.

West Malaysia has been noted on the band with 113-IR-01 heard about on a number of occasions around the 0500z mark, or sometimes earlier, depending on the conditions. Gazza 43-PR-666 (Pine Creek, NT) heard Ahmed 113-MR-01 from Port Klang at 0735z a good 5x7 working into Europe.

Latin America/Caribbean...

Brazil came through very well at 0200z with Reg 41-NZR-01 adding Pedro 3-AT-039, Lelo 3-AT-129, Alex 3-AT-175 and 3-SD-126 to the log. Reports varied between a 5x5 to 4x1 with sporadic fading noted.

Chile pushed the needle up to a good 5x7 the other day with Jorge 32-AT-137 making the log of Reg 41-NZR-01. QSL via PO Box 715, Talca, Chile.

Costa Rica was heard at 0102z with 69-SD-010 working 79-PT-101 in the Philippines, both a good 5x5 in Sydney. Just a couple of channels away Enrique 69-CR-101, near Heredia, was noted chatting to John 41-JR-767 in New Zealand, both a fair 4x3 at the time.

Cuba raised a few eyebrows with the sudden appearance of 88-PAS-106 at 2155z on a totally dead band. It didn't last long though, I heard Adrian 43-OM-09 snap him up, but by the time they moved to another channel the Cuban had faded away completely. Moments later 88-CR-01 also appeared on the call channel with a weak 4x2 report.

Saint Martin, not to be confused with Sint Maarten, mentioned below, will be active for the next two to three years with Bruno 14-AT-263 signing as 207-AT-263. Bruno will come on as much as possible in his free time, he's on Saint Barthelemy Island (NA-146). QSL to 1-AT-041.

Sint Maarten popped up on the call channel at 0156z with 166-AT-106 a fair but workable 4x4 report. No one answered his two calls and he then disappeared elsewhere on the band.

Suriname pushed the meter up to a reasonable 5x5 at 0102z with 73-IR-315 heard on the call channel. Then he was quickly snapped up by 41-KR-023 in New Zealand.

Uruguay popped out of a relatively quite band the other morning at 2259z with 12-SA/DX heard 4x3-report calling "CQ Pacific." Sadly, there were no takers and he soon disappeared. Moments later, Raul 12-SD-110 appeared for a few minutes, he was 5x3 at 2307z.

Epilogue

Let's hope that things pick up considerably now that we are into spring, adverse solar conditions haven't exactly helped the DX cause on the HF bands either. Reports are welcome from readers, via the email address at the start of the column. Special thanks go out to Reg 41-NZR-01, Tom 43-TT-05, Peter 43-FP-103, Derrick 43-LR-001, Gazza 43-PR-666 and Sandra 43-SN-010.

73 de Jack.

ESR

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International Broadcasting News

Important Regional Broadcasting Meetings Conclude

Three important conferences concluded recently, associated with world radio broadcasting:

• The Asia-Pacific Broadcasting Union High Frequency Conference, Kuala Lumpur, Malaysia (which developed the master schedule for participating broadcasters for the B03 season) (professional attendance)

• The European DX Council Annual Meeting, Frankfurt, Germany, attended by over 50 people, including international broadcasters, representatives of EDXC Clubs, hobbyists, equipment distributors, and members of non-EDXC DX Clubs. The major sponsor was the World Radio TV Handbook, with extensive coverage given to Digital Radio Mondiale (DRM) technology (open attendance)

• The High Frequency Coordination Conference/Arab States Broadcasting Union Meeting, Tromso, Norway (which developed the master HFCC/ASBU schedule for the B03 season for participating organisations) (professional attendance)

I received special invitations to attend the Frankfurt and Tromso meetings, but it was physically impossible to be at either, due to the clash with my recent 11 day trip to New Zealand.

New Transmission Season

The B03 season runs for five months from October 27, 2003 until March 27, 2004, and will be associated with decreased, but erratic solar activity as we move downwards through Solar Cycle 23.

Frequency Planning for international broadcasting under such circumstances is difficult, as theoretical predictions may not always work out in practice some months into the future!

From our viewpoint on the "bottom of the world" (!) here in Australia and New Zealand, we will note some gradual changes in propagation patterns during our summer months, and generally, the higher frequency bands (15 MHz, 17 MHz, 18 MHz, 21 MHz) will be open for the full 24-hr period for daytime transmission paths.

However, major broadcasters will have moved downwards in frequency for the northern winter, with serious congestion becoming apparent in the 13 MHz, 11 Mhz, and 9 MHz bands for long-haul circuits.

The decreased sunspot count will also impact onto signal effectiveness for European broadcasters targeting the Australia/Pacific area via short-path on the higher frequency bands during our evening hours, with some stations moving these transmissions to local morning timings here on 11, 9, and 7 MHz.

Watch out for unusual daytime propagation from Asia and Africa during our summer months, especially around local noon in Eastern Australia, where propagation anomalies always appear on the 9, 7, and 6 MHz bands, defying all attempts at explanation!

Massive Frequency List

A very large text file titled "Shortwave Frequency List" has appeared on a Website, originating from the Nagoya DXers Circle. The list is in descending order of frequency, showing national, international, and non-official broadcasters. The data gives frequencies, times, days, languages, sites, powers, azimuths, ITU coordinates, geographical zones and organisations. The list appears to be a combination of registered frequencies for the current season (many of which are not active), plus many redundant assignments for past seasons.

The list is available at http://www2.starcat.ne.jp/~ndxc/

Digital Radio Mondiale Technology DRM Regular Transmissions

On June 16, 2003, 16 of the world's leading broadcasters began their live, daily DRM broadcasts and special programs. At the same time, DRM member Coding Technologies announced that production of a second-generation, DRM-capable world band radio is underway.

These radios are expected to become available in late 2003. Additional DRM-capable receivers are expected in markets worldwide within the next couple of years.

But if you are interested in hearing the digital clarity and excellent reception of DRM right now, here's how: The DRM Software Radio Project, managed by DRM member VT Merlin Communications, gives radio enthusiasts who purchase software, access to live, daily DRM broadcasts from leading broadcasters who participated in the June 16 launch, as well as test transmissions from future DRM broadcasters. Details are at http://www.drmrx.org

Technical and Marketing

One idea about a secondary application of DRM technology is to provide local service on the higher HF bands that don't see a lot of use, such as 21 and 26 MHz.

All times, days, and dates are in UTC. Add 10 hours for Eastern Standard Time, 11 hours for Eastern Summer Time, 10.5 hours for Central Summer Time, 9.5 hours for Central Standard Time, eight hours for Western Time, 13 hours for NZ Summer Time, 12 hours for NZ Standard Time.

All frequencies are in kiloHertz (kHz)

Target areas: Au = Australia, Eu = Europe, Am = America, As = Asia, SEA = South East Asia, ME = Middle East, Af = Africa, NAm = North America, SAm = South America, CAm = Central America; NAs - Northern Asia; SAs = Southern Asia.

Items without source attribution are based on information received directly by this column from the stations.

This could be accomplished using low power transmissions (500W to 1kW) and would provide a service comparable to FM in quality.

At a recent National Association of Shortwave Broadcasters (NASB) meeting in the USA, Don Messer (IBB) gave recognition to Mike Adams for his efforts in arranging for test and demonstration of DRM transmissions, and to Herb Jacobsen for his work in developing a DRM capable transmitter exciter. About six types of DRM exciters are ready for marketing (shortwave and mediumwave).

Wide mediumwave usage of DRM is necessary if it is to find sufficient support for practical shortwave application.

At WRC-2003, around a dozen DRM transmissions at various frequency ranges were broadcast into the Geneva area. Several of the participating broadcasters have committed to continuing with DRM transmissions after this special demonstration period.

Receiver manufacturers expect to have consumer-type DRM-capable receivers available by the end of 2004. These receivers will be capable of working with other modes (eg. AM/FM), and may be customised to the market in which they will be distributed (ie: models for Europe may differ in some regard for models intended for sub-Saharan Africa).

At this point, Don anticipates that making a DRM-capable receiver will increase the cost by about US$50 above the cost of a comparable receiver without DRM capability.

Specifications and standards for implementing DRM technology are worked out, improved, and available. Some DRM features are still being tested relating to channel width, with simulcast (both analogue and digital simultaneously) approaches, and with automatic selection of the best receive frequency (when multiple options are available).

Another aspect still under test is the application of DRM technique to single-frequency networks, such as are commonly already used in Europe for public broadcasting (to cover an entire country with a service using one frequency on multiple synchronised transmitters).

Don is pushing within the DRM group for the preparation of a "how to" manual for broadcasters. This would explain at a user/shortwave level how best to make application of DRM technology.

The DRM signal has much more energy, proportionally, near the edges of the occupied channel than does a double sideband transmission. This raises the possibility for much more adjacent channel interference by a digital transmission as compared to an analogue transmission.

Tests and analytic work show that, for an adequate interference protection ratio, a digital signal must be operated at about 7 dB less power level than would be appropriate if it were a regular analog AM transmission being used.

That this factor was not observed in the past on-the-air tests, and because some DRM test transmitters were not adjusted to comply with the DRM-specified emission "mash", resulted in many complaints by listeners of major interference (excessive occupied bandwidth), for some DRM test transmissions. (Source: National Association of Shortwave Broadcasters)

World Radio Communication Conference 2003

Key Outcomes Affecting SW Broadcasting WRC-03 A Success For Australia

A proposal for technical and regulatory arrangements to accelerate the development of wireless local area network (WLAN) hotspots was one of six Australian positions endorsed at the recent World Radiocommunication Conference 2003 (WRC-03).

The conference was held in Geneva from June 9 to July 4. Australian Communications Authority (ACA) Deputy Chairman Dr Bob Horton, who headed the Australian delegation to the WRC-03, said the conference was a success for the Australian positions promoted in Geneva.

"The conference covered issues related to the allocation of radiofrequency spectrum to radiocommunications services as well as the means of sharing globally allocated spectrum and other matters aimed at improving the efficiency and effectiveness of the ITU Radiocommunication Sector," Dr Horton said.

Other actions reviewed at the conference that resulted in positive conclusions for Australia were as follows:

- Recommended bands for public protection and disaster relief were identified as a guide to spectrum planners and equipment manufacturers.
- Future GPS development and operation will not be overly constrained and improved positioning data is able to become available post 2008, especially if the Galileo network is implemented.
- Telstra's rural communications system will be protected from satellite interference that could have disrupted the service.
- Meteorology and radioastronomy services will be protected from satellite interference that could have degraded their operations and observations respectively.
- The safety of aeronautical navigation systems was maintained and access for new and improved systems was provided. (Source: ACA)

Australian Position At WRC-03 - HF Broadcasting

A key Agenda item concerning HF broadcasting was:

"to review and take action, in light of the studies and actions set out therein, having particular regard to the advancement of new modulation techniques, including digital techniques, capable of providing an optimum balance between sound quality, bandwidth and circuit reliability in the use of the HF bands allocated to the broadcasting service".

The formal Australian position concerning this item was:

- To promote the use of digital technology such as DRM in short-wave broadcasting
- To support early commencement date (1 January 2005 or later) for access to the WARC-92 HFBC extension bands.

It is Australia's firm objective that the early availability of the extension bands should be used as a means of encouraging and facilitating the transition to DRM. Every effort must be made to make the early availability of the extension bands conditional on the introduction of DRM services. (Source: ACA)

IBB Remote Monitoring System Sites

Bill Whitacre of IBB Frequency Monitoring reported to a recent NASB meeting in then USA that 60 Remote Monitoring System sites are active. Additionally, they employ a major network of human monitors. They've been doing some monitoring work for the HFCC verifying whether or not coordinated transmissions are in fact taking place.

This effort has turned up many "wooden transmitters"—cases where more frequency hours are coordinated than are actually used. The HFCC makes contact with major offenders. Resolving this problem is a process, not a one-shot effort.

(Note: Anyone can access the RMS services, which is at http://monitor.ibb.gov/

If you haven't been there, why not do so?)

Broadcasting News

Australia

HCJB-AUSTRALIA. A new schedule for HCJB-AUS from Kununurra, Western Australia, was put in place recently, including the introduction of Urdu programming, a new English service for morning reception in New Zealand, and a new morning transmission to South Asia:

0100-0130 15420 Urdu to South Asia

0130-0330 15420 English to South Asia

0800-1230 11750 English to Australia and New Zealand

1230-1700 15390 English to South Asia

1700-1730 15405 Urdu to South Asia

1800-2030 11765 English to New Zealand and Australia

Unfortunately, serious problems have emerged with service reliability, with the morning service to NZ being virtually inaudible in the target area, due to the assigned frequency being too low for satisfactory daytime propagation. The daytime service to South Asia on 15420 is also ineffective in the target area, due to co-channel interference from Radio Australia Shepparton, using the adjacent frequency of 15415. The evening services to South Asia have also been unreliable, due to unfavourable propagation on 15 MHz at those times, and co-channel and adjacent channel interference from major broadcasters targeting the same area.

There are serious technical constraints at Kununurra, mainly due to the antenna used for the South Asia beam on 15 MHz being unsuited for any other frequency band. The antenna used for the Australia/Pacific beam on 11 MHz similarly cannot be used on any other band.

These technical limitations are seriously inhibiting the broadcaster's desire to attract and retrain a substantial, regular audience in South Asia and the Pacific region, and I understand that modified/new antennas are being considered.

Aboriginal Resource And Development Services Inc (ARDS)

ARDS is an Aboriginal controlled non-profit organisation which began transmission on August 1 over a Shortwave Radio Service for Community Development.

The service enables the Yolngu (Aboriginal) people of north-east Arnhem Land to receive informational programs broadcast in their own language and has the potential to reach up to 7,000 Yolngu living in the five major communities and ninety homeland centres across the region.

Mr Richard Trudgen (Business Manager of ARDS) stated: "ARDS is extremely pleased to be launching this much needed service. This educational service heralds an exciting new time for Yolngu people who will now be able to access all sorts of information on Health, Economics, Law and much more."

The Radio Service will use a concept developed in Africa called "Radio Browsing". This is where listeners can ring the studio to ask for information they want to hear over the radio. Radio staff research the information via the web and/or other sources and develop a program to put to air. It also allows listeners to be directly involved in the development of programs.

A Yolngu person within the region and a radio announcer/interpreter can have a discussion, with a doctor in Darwin about diabetes using a three-way telephone connection.

This discussion would all be recorded and then later broadcast via the Radio Service. Radio Browsing allows the people to stay in their own homes and access all sorts of information, all in their own language.

The Rev Dr Djiniyini Gondarra (political leader of the Golumala clan) who has been involved in developing programs for broadcast stated:

"I am very pleased and excited to be involved with this radio service. There are just so many things that Yolngu people are having problems understanding and this is a great way to get information in a quick and easy way."

ARDS has secured some support from government, non-government and philanthropic organisations to develop various programs. This includes sponsorship to develop information on Renal Failure, Diabetes, Hepatitis C, HIV, Petrol Sniffing and Law and Order. They will be looking for on going support and jobs to keep this service operating.

http://www.ards.com.au

Transmitters

The transmitters are ex-Civil Aviation, using 5050 in the 60 mb. They were manufactured by Commonwealth Electronics and are AM20 models. They can operate at 1 kW but operate continuously at 400W. The location is Humpty Doo S12.34.05, E131.04.35. Antennas are two fibreglass helical whips with a front to back ratio of -50dB and a beam of 110 degrees centred on 100 degrees true from Humpty Doo.

Licencing

This is a "Broadcasting Licence Category HF Domestic Service" with the callsign VKD963. The date of effect is March 3, 2003 and expiry is March 3 2004. Special conditions apply, where the licensee may be required to cease operating the station, or operate the station under revised conditions, if the Australian Broadcasting Authority or the Australian Communications Authority receives an objection to the station's operation as a result of the international notification of the station. The intended area of coverage is "local".

ARDS is also licensed for medium-frequency broadcasting, using off-band channels under the category of "Narrowband Broadcasting Station", in the Northern Territory, with 400W:

1611 kHz VKD883 Milingimbi

1611 kHz VKD884 Groote Eyland

1620 kHz VKD885 Galiwin Ku (Elcho Island)

1629 kHz VKD886 Gapuwiyak

The satellite link is allocated on 6.35794 GHZ, as a Fixed Earth Station, Nhulunby.

HF Service

It should be noted that the HF service is for local broadcasting only, with the primary radiation pattern in an easterly direction from Darwin, generally covering the eastern part of the Northern Territory, Arnhem Land, and into NW Queensland. Side lobe radiation extends to NE Western Australia, and northern South Australia. Low level back-lobe radiation extends northerly into Timor and Eastern Indonesia. Antenna configuration has been designed to provide satisfactory coverage during daylight hours out to about 2000 km from Darwin. At night, coverage will expand.

DXer reports from places well outside the primary service area complain about night-time co-channel interference from transmitters in China, Tanzania, and the USA. Such reports are of academic interest only, not affecting reception in the main service area. Similarly, It is doubtful if ARDS, with its low power of 400W, will cause harmful interference to those transmitters.

Reports are welcome at dale@ards.com.au or by mail to ARDS, Box 1671, Nhulunbuy, NT 0881, Australia. Studio Address: 19 Pera Circuit, Nhulunbuy NT 0880, Australia.

China

China National Radio

CNR's Second Network offers English Teaching programs at various times on MW, SW, VHF and the Internet. The early morning release is at 2225-2245, and in Melbourne best HF signals are on 6010 7335 7360 and 11985. This assists preparation of reception reports for QSLs, rather than the bland/inappropriate "woman talking in Chinese..." !

China Radio Int. New Services

CRI recently introduced an additional daily transmission in Hindi targeted towards the Indian subcontinent, 1300-1400 on 11765 and 13715. CRI already has two services in Hindi, 1500-1600 on 9690 11675, and 1600-1700 on 9690 11675. New morning transmissions in German to WEu have also commenced: 0500-0557 and 0600-0657, both on 15215 and 17690.

Further new broadcasts include: Tamil 0200-0227 on 13715 and 15145; Nepali 0230-0357 on 13790, according to Jose Jacob, Hyderabad, India.

Germany

Deutsche Welle Frequency Change

DW's German programs for East Asia recently moved to 15720, replacing 12090, for the 1200-1400 release, and from 1400-1600, to South Asia. Both transmissions are from the Moscow relay.

Israel

Voice Of Israel (Kol Israel) Frequency Changes

The Voice of Israel, Jerusalem, made some frequency changes recently. Persian: 1400-1500 Su-Th and 1400-1525 Fr/Sa is on on the new channel of 17525, replacing 13850, parallel with 15640 and 17545.

Korea South

RKI Opens Special 50th Anniversary Web Site

Radio Korea International, the overseas service of the Korean Broadcasting System, has opened a special Internet web site to mark its 50th anniversary. Since first transmitting its inaugural signals as the Voice of Free Korea on August 15, 1953, RKI has been serving as Korea's external broadcaster for the past half century, proudly fulfilling its mission to bring Korea to the rest of the world. The web site will feature the yesterday, today and tomorrow of RKI, its vision for another half century of broadcasting excellence, and congratulatory messages from dignitaries from home and abroad and worldwide listeners. Visit http://rki.kbs.co.kr

Mongolia

Mongolian Radio Reactivates 60mb

The Mongolian Radio, Domestic Service, has been heard recently in Eu (by Anker Petersen, Copenhagen) on 4830 and 4895, opening at 2100, until fade-out at 2240. Anker suggests that the 4895 transmitter may be more easterly than 4830, based on propagation patterns at his location in Northern Europe.

Anker says:.." In the early 1990s, Radio Ulaanbaatar was regularly heard with two 50 kW transmitters at Ulaanbaatar on 4080v and 4850v. Some regional, 12 kW transmitters were also heard including Altai in West Mongolia on 4830 and Mörön (Murun) in the more Central, Northwestern Mongolia.

Our Tropical Bands Surveys indicate that these stations ceased operations in 1994-1995 for unknown reasons, but now at least two transmitters are back, probably after repair, because their audio does not sound as coming from new transmitters. My guess is that we hear Ulaanbaatar with 50 kW on 4895 (ex 4850 or 4080) and Altai on 4830 with its old 12 kW transmitter".

The station is observed here in Melbourne in the same time period, on both channels, but 4830 is blocked after 2130 by ABC-NT service opening on 4835, and 4895 is difficult due to Port Moresby on 4890. 4895 is blocked after 2145 by Kuching with its pre-sign on test tones, on the same frequency.

Netherlands

Budget Cuts At Radio Netherlands

An independent survey carried out by the research bureau TNS NIPO shows little support amongst the Dutch public for further budget cuts at Radio Netherlands. 840 people were interviewed between June 24 and 30 2003. 27% said they listen to Radio Netherlands when they're abroad - equating to around 3 million listeners. 37% of those questioned said they were opposed to further budget cuts, compared to 22% who declared themselves in support of cuts, and of those who supported cuts three out of ten said they would change their opinion if it meant that Radio Netherlands would cease to exist. Two thirds of those who said they listen to Radio Netherlands declared that they were opposed to cuts. Asked to choose between scrapping Radio Netherlands and other cost-saving measures such as getting rid of the radio orchestras, 37% of those who expressed an opinion supported Radio Netherlands against 22% who wanted to preserve the orchestras. The survey was carried out on the initiative of TNS NIPO itself, and was not commissioned by Radio Netherlands. (Radio Netherlands Media Network)

Russia

Khabarovsk Branch Of Voice Of Russia To Close

According to a letter from the Japanese language staff of Voice of Russia, the Khabarovsk branch will be closed in the near future. Station personnel oppose the closure and seek support from listeners. They invite listeners to send messages against the closure to VOR Moscow by E-mail, at vostok@vor.ru

The VOR Khabarovsk branch has produced the programs mainly for the Russian Far East since 1946 in Japanese, Chinese, and Korean. According to another source, the decision is from headquarters in Moscow due to financial and political reasons. The closure date is expected in October. (Takahito Akabayashi, Tokyo)

Taiwan

Taiwan Does It Alone

The ITU does not recognise "Taiwan" as an official entity for radiocommunications' planning purposes. HF planning is managed by the Broadcasting Corporation of China, in Taipei, and there is no formal technical representation in the HFCC or the ABU-HFC. HF transmission planning is carried out generally in isolation from the rest of the world, and the authorities in Taipei decline to recognise Beijing as the parent regulatory body.

Entries will be found in the HFCC data for "Taiwan", but these are limited to the use of relays, such as arranged by Merlin, and other international brokers.

Operational dates for HF transmission plans for the CBS are not aligned or coordinated in advance with those in use by the majority of other broadcasters, which is the reason for the activation of the schedules at unusual times during the year. There is no acknowledgment of the official "A" or "B" seasonal timetables.

That is the reason for the many frequency collisions for the CBS national and international transmissions, where CBS services are on top of established broadcasters.

Taiwan's International Broadcaster Changes Identity

Taiwan's international broadcaster changed its on air name, with Radio Taipei International now known as Radio Taiwan International. The station says it has discovered that the name Taipei has negative connotations in the minds of some listeners. The new station ID is reflected across all 12 languages used for the external service.

Uganda

High Adventure Ministries

According to the latest newsletter of international Christian broadcaster High Adventure Ministries, plans to set up a shortwave station in Liberia have been abandoned due the political situation there. The organisation says it has received permission from the Ugandan government to set up the station in Uganda instead. This will enable High Adventure Ministries to resume shortwave broadcasts to the Middle East. Three years ago, the organisation was forced out of its station on the Israeli/Lebanese border, which had been operating for 30 years, when Israeli troops who had been protecting the area were pulled out.

United Kingdom

BBC North America Audiences Increase

According to the BBC's latest Annual Report and Accounts, the BBC's audience in North America has increased from 2.3 million to 3.9 million since shortwave transmissions of the World Service were dropped in July 2001.

That's an increase of 70%. BBC World Service coverage of the conflict in Iraq was taken by 353 US public radio stations compared to 265 in March 2002. The BBC says that, on average, 22% of "opinion formers" in Boston, New York and Washington listen to the World Service each week. (RN MN)

Bible Voice Schedule Changes

There have been some recent schedule changes for Bible Voice, based in the UK: the service to EEu and Russia moved to 6010 (replacing 5970) Mo-Fr 1800-1845, Sa 1801-1900, Su 1801-1930, via Wertachtal (Germany). A new service is also listed, starting at 1700, Mo-Fr, on 17860, from an unspecified transmitter site.

Early Shortwave Stations In Australia by Dr. Adrian Peterson, Adventist World Radio, PA, USA

Regular radio broadcasting on mediumwave got going in the United States about the year 1920, and soon afterwards in Europe, New Zealand and Australia. Over in Europe and Australia, longwave broadcasting was also introduced around the same time, though in Australia a few years later all of the longwave stations moved into the standard mediumwave band. In the second half of the 1920s, experimental broadcasting on shortwave was introduced in the United States, Canada, New Zealand and Australia. In Australia, there were three different organisations that were on the air shortwave in that era, and they were:

- semi-government AWA company
- government ABC network, and
- series of commercial stations.

During a three year period running from 1926-1928, Australia's first radio broadcasting station, 2BL in Sydney, ran a series of shortwave broadcasts using the amateur transmitter 2YG. The amateur station 2YG belonged to the chief engineer at 2BL, and he ran these experimental relays from his home in suburban Coogee. Soon afterwards, he transferred the transmitter to the empty home of a relative in another suburb, Roseville. The two major stations in Sydney, 2BL and 2FC, were amalgamated in 1928. The shortwave broadcasts from 2BL were then carried for a very short period of time by the well known VK2ME at Pennant Hills, after which they were then discontinued.

However, a new series of broadcasts began from the Pennant Hills transmitter using the programming from the other mediumwave station 2FC. These were on the air for a couple of years, in 1927 and 1928. Down in Victoria, the programming of the mediumwave station 3LO was on the air shortwave from a 3.5 kW unit co-sited at outer suburban Braybrook. These broadcasts were on the air for about three years, stretching from 1927-1929.

Then there was the ABC experimental station VK3LR which was on the air during scheduled hours with a relay from mediumwave 3LO and 3AR, and outside scheduled hours with test programming as VK3XX. This was a 600W unit at Lyndhurst which was later increased to 2kW and subsequently absorbed in 1939 into the new network for "Australia Calling".

Over in Western Australia, similar experimental broadcasting on shortwave was carried out by Wally Coxon, using his amateur transmitter 6AG. He began in 1925 at Maylands, and moved in 1927 to Mt Lawley, and in 1928, he co-sited the shortwave transmitter with the mediumwave unit on the roof top of the downtown building of Westralian Farmers. Four of these stations, 2BL and 2FC in Sydney, 3LO in Melbourne and 6WF in Perth were subsequently absorbed into the ABC network, and of course, 3LR-VLR was established as an ABC relay station.

The programming of all five of these stations was heard at times in Europe, North America and throughout Oceania. QSL cards were issued by all of these shortwave stations, and cards known to be in existence are from 2FC shortwave and the old VK3LR.

Euro Dx Council In Crisis Mode

Here's a report from my colleague Frans Vossen, host of "Radio World", of Radio Vlaanderen International, who attended the recent EDXC Annual Meeting:- During August, over 50 shortwave listeners, equipment representatives, DXers and broadcasters attended the annual conference of the European DX Council (EDXC) in Koenigstein, north of Frankfurt. The event had been organised by a local DX Club, the Rhein-Main Radio Club (RMRC).

As usual, it was a great occasion to meet old friends and make new ones, which is not difficult, because we all share an interest in international radio. Some are only interested in the technical side of the hobby, others only care about program content, not to forget those who collect radio items, in particular QSL cards, or pennants.

At this year's meeting, the emphasis was on DRM - Digital Radio Mondiale, with most amazing presentations about this new broadcasting technology and the latest from the DRM receiver's front. The Secretary-General of the EDXC, Luigi Cobisi of Italy, was pleased with the conference.

Meanwhile, the EDXC is in a bit of a crisis, or has been for several years now. It seems that in this age of new technologies, not only the DX hobby is in decline, but also the need of people to join up in special clubs or the need to publish club magazines. Everybody is hooked up to the internet anyway, and information can be exchanged more rapidly than ever before. In a move to save the EDXC Luigi Cobisi launched the idea to make it an organisation for individual members, not only collective members grouped in DX clubs.

Luigi is stepping down as Secretary-General at the end of this year, and the future is uncertain. Who will step forward and take over, who will organise a conference next year? Nobody knows, we'll have to wait for another couple of months to see whether the EDXC can be saved.

Australasian Shortwave Guide

Edition 16, with over 1400 entries, covers the international shortwave transmission period (B03) commencing on October 26, and concluding on 27 March 2004. Publication date is November 8.

Authored by myself, the Guide has been issued twice annually for several years, and is regarded as the most detailed and accurate listing available - 36 pages, handy A5 format, saddle stitched.

It provides comprehensive information of English shortwave schedules to Australia, Asia, the Far East, the Indian sub-continent, and the Pacific, and for broadcasts in all languages to Australia and the Pacific.

The data is arranged in two sections, by studio country and starting time. Each entry shows broadcasting organisation, frequency, starting time, finishing time, language, target area, transmitter site, transmitter country, studio country, and days of operation.

I compile this mainly as a labour-of-love project. You may obtain a copy by sending me $10 (use my address at the head of this column), which goes towards the expenses of editorial research, telecommunications charges, printing, binding, postage and packing. Payment by cash, cheque, or money order.

Electronic Dx Press

Many readers have joined the Electronic DX Press, which is an electronic news service, managed by myself. New features have been introduced recently, including the on-line

Community Forums, covering a range of topics, including international radio, tropical band DXing, monitoring trips, spectrum studies, Australian domestic radio, reception reporting, propagation, antennas, receivers and QSLs.

Membership of the Forums is free.

Please visit http://edxp.org for an on-line application form. We have some 145 members worldwide, with 56 in Australia.

Who is ACBRO?

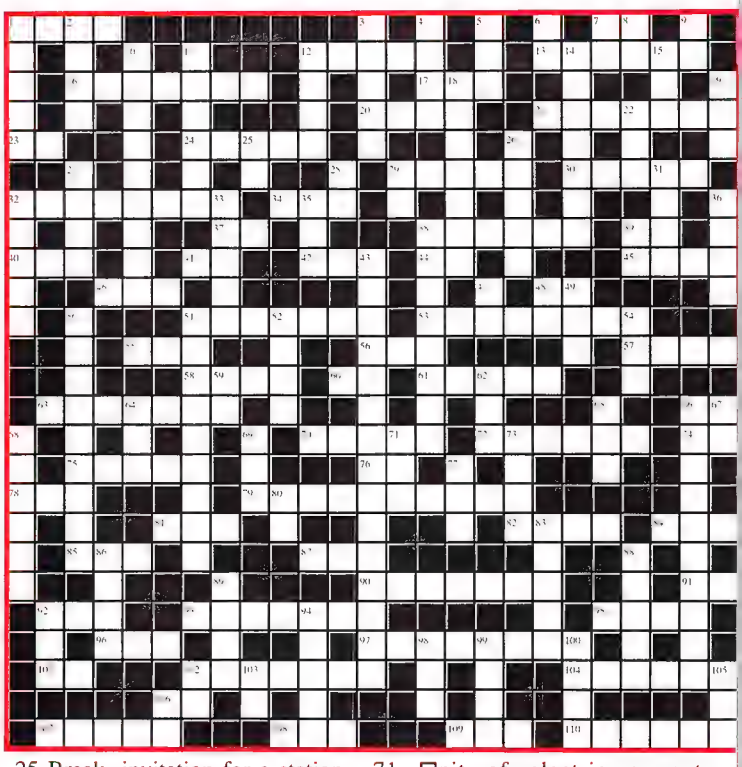
Australian Citizens Band Radio Operators

ACBRO has served Citizens Band Radio Operators and the CB Fraternity by providing a centre point and a portal to the Citizens Band Radio Service in Australia since the late 1970s. ACBRO has established itself as an advocate, advisory service, resource centre, a means of educating the "new" CBer and as a liaison between the CB Fraternity and the Federal Government for the benefit of all Australian Citizens Band Radio Operators. The ACBRO Association publishes a magazine, available to members, with up-do-date news about the latest on the CB scene. Apart from individuals becoming members, clubs can affiliate with ACBRO and add their backing to the Association.

To join ACBRO and add your voice as an individual or club, please write for an application to...
ACBRO Team Inc. 1980, PO Box 170, Walkerville, South Australia 5081, Australia
or email ACBRO at acbro@hotmail.com with your request. Alternatively, an application form can be downloaded from ACBRO's website by visiting www.geocities.com/acrboteam and following the links.

October Crossword

(Apologies for last months crossword disaster, a correct copy of the September crossword puzzle will appear on the ESR web site.)



It appears that I have mis-used this otherwise excellant program, causing the clues in the last issue to be jumbled. Hopefully these problems are now overcome, and to ensure it doesn't happen again, it will be fully proofed every month. I regret any anguish I have caused those ardent lexicologists out there.

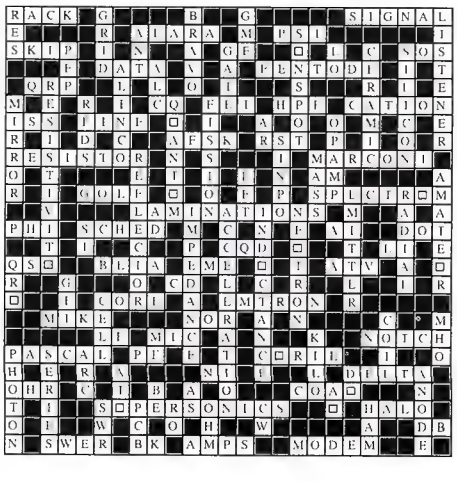
ACROSS

1 One unit of a battery.
7 Change in Velocity
12 A device intended to pass DC while rejecting ac.
13 What goes into a microphone
16 One who is not professional
17 Automatic Gain Control.
20 Phonetics for "L"
21 A negative electrode
23 For Example
24 An assembly of conductors often including insulation.
29 Negatively charged ion
30 Material that has an almost zero coefficient of expansion -Nikel/Steel alloy
32 FM signals without any noise have full....
34 Band pass filter.
37 Class of Amplifier operation using push-pull but with more bias current.
38 Meaning to switch on and off in order to modulate intelligence onto a signal.
39 Voltage Transient
40 Slang for the source of an old radio.
41 Millimetre.
42 Listing of previous contacts
44 Local Oscillator.
45 Phonetics for "K"
46 Electro-Magnetic Force.
48 CW abbreviation for "Call for any contacts".
51 Developer of the theory of electromagnetism
53 Light band formed by white light passing through a prism.
55 Beat Frequency Oscillator
56 Light Dependant Transistor
57 Colloquial term referring to static noise.
58 Do Not!
60 Symbol for Silicon, also International Standards
61 Device which receives, creates and/or emits electromagnetic radiation
63 The theory advanced by Einstein to explain the photoelectric effect
66 Rules from 3MHz to 10m
70 First series in the spectrum of hydrogen
72 The constant of proportionality between the energy of a photon and its frequency.
74 Electromagnetic abbreviation
75 Radiation particles equivelant to helium nuclei
76 A simple form of modulating a carrier with an audio or other signal.
78 Press To Talk
79 The taking up of radiant energy by molecules
81 Logical opposite, gate to invert a logical input.
82 Slow Scan Television
84 Go away, stop sending!
85 An abbreviation for a signal report including reception, strength and tone.
87 Radio manufacturer from Australia
90 Neutral charged atomic particle.
91 Differential Pressure
92 Interference from a broadcast station.
93 Accepted father of radio
95 How high in frequency is light?
96 Internet point of presence -a computer connected to the web.
97 Radio stage used to demodulate AF from a carrier.
101 CW abbreviation for "Transmitter"
102 A quantum of information conveyed from sender to receiver usually on behalf of a third party.
104 In electronics, a circuit to remove unwanted electrical signals and noise.
106 Audio Frequencies
107 Alloy of copper and zinc.
108 High Pass Filter
109 Q-Code for "Low power operation", involving weak transmitters or attenuation.
110 One after another inline.

DOWN

1 A unit used in the measurement of radioactivity
2 Metal used to make solder.
3 His gas law applies at constant temperature.
4 Directional antenna
5 Abreviation for Microphone
6 Home of K and W callsigns.
7 CW for "from".
8 Canadian Call prefix.
9 Abbreviation for Channel.
10 A force produced by the motion of charged particles
11 Radio transmitter used for indicating propagation.
12 The rules we live by as amateurs, also slang for CW.
14 Sense of a signal in relationship to another signal, with regard to the timing of the maximum amplitudes.
15 Cathode Ray Oscilloscope
18 Italian physicist who first used the telescope in astronomy.
19 Power rating used on sideband transmitters.
22 Hi Voltage
25 Break -invitation for a station to join a CW QSO.
26 Phonetics for "I"
27 Where the energy goes when it□s done.
28 Low Frequency radio band.
29 Rare Australian call letters used for special events.
31 Prefix to oppose, or to go against the norm.
32 One of the building blocks of elementary particles
33 Antenna matching system, greek letter.
35 Phase Locked Loop.
36 Metal rarely used in pure form.
38 Valve especially useful at microwave frequencies.
39 Australian Amateur Radio callsign prefix.
43 Semiconductive alloy. □7,8□
47 Symbol for Germanium.
48 Current Transformer
49 Code for "□our transmission was interfered with".
50 A non conducting material.
51 Radio stage where intelligence is added to a carrier.
52 The physical unit for measuring power named after Scottish Physicist.
54 □nit for measuring conductance.
59 Old Man!
62 Resonance indication on a GDO.
64 Horizontal QRP!
65 Binary Coded Decimal - a digital numbering scheme.
66 A frequency resulting from the mixing of two or more other frequencies.
67 Frequency is adjusted according to the amplitude of the modulating signal.
68 Capacitive method of shortening an antenna. □3,3□
69 Greek letter
71 □nit of electric current □Abrev□
73 Device used for focussing light or radiation, usually made of Glass.
77 Receiver Incremental Tuning.
80 Chemical element -Beryllium.
83 Signal strength, interference, noise, fading and overall rating.
86 Radio waves that refract off the ionosphere to return to earth some distance away.
88 Alloy mainly consisting of Iron and Carbon
89 Element which allows a FET to turn on.
92 Smallest unit of binary coded information.
94 Integrated circuit amplifier, with both inverting and non-inverting inputs and a single output.
98 Trans-Equatorial Propagation
99 One who communicates via the Citizens Band
100 The medical service that operates by radio and serves the outback as a flying ambulance.
102 From 1000m to 100m band
103 End of a CW contact.
105 Resistance Abreviation
106 Stand by in Morse Code

□September Solutions□



RADIO-ADS Classifieds . . .

SELLING RADIO GEAR?

—then we will give you a free advertisement !

ADVERTISE YOUR RADIO GEAR — in ESR Magazine — ABSOLUTELY FREE!

GET RID OF OLD EQUIPMENT THAT YOU NO LONGER USE! FOR FREE!!! THAT'S RIGHT, PRIVATE CLASSIFIEDS - FREE FOR CB AND AMATEUR RADIO EQUIPMENT! FREE FOR VINTAGE, SCANNER, AND GPS!

So dust off that old relic, put a price on it's head, and get busy with the keyboard or pen! Somebody else must want it!

Conditions Apply...

This classified section is for private sales/purchases only.

(Non-commercial) readers of ESR magazine may use this classifieds section without charge!

This offer applies to private **'For Sale', 'Wanted' 'Swap', 'Club Events', 'Stolen Equipment'** and any other private classified listings.

Radio Clubs may advertise as a private identity, but a name (eg the secretary) must accompany each advert as signatory.

Small &/or Home Businesses & Weekend Traders may be charged for space -at very reasonable rates.

Businesses may advertise employment situations free of charge where the position is of potential interest to readers.

Otherwise this offer is for radio, communications, and associated equipment only! Amateur gear, CB radios, scanners, antennas, towers, test equipment, cable, power supplies, books, items and parts -Wanted or For Sale… You name it... it's all fair game as long as it's for radio!

If you are in any doubt about your items -submit an advert and I'll let you know if there is a problem.

Commercial advertisements will be accepted for publication, though perhaps not in these classifieds pages. See our Advertising **Rate Card**, and **Conditions** at ***www.esr-mag.com***.

Note: ESR encourages advertisers to ensure that purchasers of amateur transmitting equipment should hold an Amateur Radio qualification, and licenses should be sighted.

Inclusion of your advertisement cannot be guaranteed, but every effort will be made to place your advertisement in the issue following receipt of your advertisement.

Advertisements may be edited to fit the available space or layout requirements or to clarify the wording.

The publisher reserves the right to amend or reject any advertising material considered unsuitable for publication. If in doubt, phone us. No other correspondence will be entered into.

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Advertisements may be written in the "form" below or hand written on plain paper provided that all of the details requested below are clearly included.

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Clip or copy this form and post it to:-
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Submit by the 1st of each month for the best chance of inclusion in the next edition.

THESE DETAILS ARE NOT FOR PUBLICATION, BUT THEY MUST BE COMPLETED OR YOUR CLASSIFIED WILL NOT RUN

Your name:..... Optional Callsign: VK .....

Postal address:..... State ..... Post Code.....

Phone contact/s*: ( )..... * This number is for the editor's use only, to check any details. State if business or after hours number, and write it clearly! **This number is NOT for publication!**

Your signature: ..... Today's date: ...../...../.....

RADIO-ADS Classifieds . . .

ESR apologise for any advertisements that are unclear or short on details. If details are unclear or incorrect, please contact me by email rather than phone as finding original ads is time consuming. Assume that adverts are QTHR unless stated. The order is as entered -ie unsorted except into classifications.

FOR SALE:

Sell: Icom 271A 144MHz All Mode Tcvr mint cond. $500 also 572BT160L Linear Tubes POA Tony VK2BTL (02) 9487 3383

Sell: TS-520s DG5, Ext VFO, Tunes CB Band, $300 ono. Ryan 0404 934 882 (Qld)

Sell: FL-2100B Yaesu 1200W Linear GC $600 ono. Ryan 0404 934 882 (Qld)

Sell: TS-830s, spare finals, tunes CB, GC, $550 ono. Ryan 0404 934 882 (Qld)

Sell: FT-7 Yaesu 10W Tx GC $200 ono. Ryan 0404 934 882 (Qld)

Sell: Tokyo hipower HL-180v 2mtr all mode amp. Good condition w/manual. Offers? Phone 03-53861279

Sell: ICOM R75 Communications Receiver. 30kHz to 60MHz All mode. New cond. Used for 1 week. Have to sell due to heavy power line noise. Cost $1700 SELL $800 NEIL (07) 5594 1984 Will pay postage in australia.

Sell: Yaesu FR-101D receiver very Good condition Shortwave and Ham bands $250.00 ono please either email vulcan@rascal.com.au or phone 0413139371 Lee

Sell: SKYFOX 10/11m 9ft 1/4wave DX Base Antenna.Its Frequency is from 26mhz to 29.7mhz.It mounts with 5/16 Adaptor.It can be used for [STATIONERY MOBILE].This one is brandnew in package with manual never opened.Sell $45+post Contact Joe on 0421 412 911 or Email:dimension7@optusnet.com.au

Sell: STATION MASTER, Base Antenna series 2 Itron type 1/2wave 18ft,freqeuncy range 26mhz to 29.7mhz, can run on 20m also.Brandnew in box with manual &plastic never opened.Sell $75 ph joe 0421 412 911 or Email:dimension7@optusnet.com.au

Sell: Kenwood R-820 receiver in top condition, also SP-820 ext. speaker. Damien VK3RX Phone 03 5427 3121 Email vk3rx@wia.org.au

Sell: Philips PA systems, Valve 2 Units with 2 6CM5, 1 with 4 6CM5, 1 with 6 6CM5, plus other AF Gear, and Valves. Big Box of New 6CM5s. All to go...Best Offer. Bob (07) 5494 0471

Sell: Icom SM-8 desk mic comes dual cable and mint condition. asking $290 including postage this is a rare microphone, interested? call gusti, vk6wb@go.com

Sell: Satellite dish 2.3 m mesh comes with C band LNA. Will need a trailer to take away it is light but obviously BIG. $190 ono PACE DGT 400 digital satellite receivergood for FTA on ASISAT 2 $170 ono YAGOONA N.S.W. Call Alex 0407-808-100

Sell: MFJ-969 Unused HH/6 $475, DM-453 Power Mic New $50, 27MHz Thunder Stick Untrimmed $45, Ph Steve (03) 5941 1680

Sell: Kenwood TS-690 HF+6m Excellent Condition, original boxes etc $1100 Andy VK3DTO (03) 53821759 vk3dto@amsat.org

Sell: Yaesu FT-757 HF Txvr, FP-757GX smps, FC301 ATU, MB1B8 Mike, Kenwood RD300 Dummy Load, Morse Key. Excellent Condition. Manuals & Boxes. $850 the lot. Keith VK4VQ (07) 5530 5294

Sell: Yaesu FRG-7700 Communications Rcvr with FRT-7700 Tuner, Good Condition, with manual $350, (02) 6972 3788

Sell: Kenwood TS-430S HF xcvr, excellent condition with AM, CW, SSB filters, mobile bracket and vox, manual, circuits, original carton, $600 Yaesu TS700A 2m all mode xcvr Good Condition, manual, $350, sealord@optus.com.au 02) 6972 3788

Sell: Collins 75-A-4 Rx $450. Yaesu FR100B-FL200B with Heathkit SB610+SB620 $300. Yaesu FT570/401 $300. Pye 160m AM Transmitter with 813 finals, 805 modulators with Collins TC5 as VFO $150 Len (03) 9374 2339

Sell: Icom IC-728 xcvr 80-10m Perfect Condition 500Hz xtal CW filter, AM/FM board installed outboard VOX supplied $650 ono jmlynch@powerup.com.au (07) 3411 2796

Sell: Icom IC-746 HF-2m txvr, AS NEW! auto ATU, DSP 100w 160-2m boxes mic, service manual, eManual, Gen Cov Rx, $1980, Icom V8000 service manual New $25, Icom Bui Memory Backup, IC-290&490 $15 Kenwood TS-940S Service Manual New $25, Heil PRO 5-5 Headset includes Remote switch wired Icom 8pin. Allen (03) 6327 1171 0419 755 124

Sell: HF Linear Amplifier CE-5000E, made by Amplifier Systems Northridge CA, S/N 10-98697, Single 3CX3000-A7, 5kW Cont.O/P, 13dB@3-30MHz, 3phase Power, 44x25x24" nearly new in original crate. If you are serious, have a ute and have spoken to ACA, please ring Harro VK5HK (08) 8323 9622 or fax (08) 8323 9659

Sell: Ranger RCI-2950 26-30MHz 40Watt O/P in Ex-cond. $375(ONO) Glenn (02) 6794 4521

Sell: Stalker9 CB 40Ch SSB/AM in Ex-cond. $130(ONO) Glenn (02) 6794 4521

Sell: Electrophone Pwr Supply -10Amp $70(ONO) Glenn (02) 6794 4521

Sell: 100W HF Linear $80(ONO Glenn (02) 6794 4521

Sell: Magazines CB Action 10 issues from 11-49 any offer, Glenn (02) 6794 4521

Sell: Kenwood TS-50 HF 100 Watt Tcvr, Mic, mobile mount, book, good cond $900, High Current Power Supply, Home Brew, Overvoltage Protection, V&I Meters $250, 30A Pwr Supply, Home Brew $200, 2@5A Pwr supplies, Home Brew $50ea, 24V-12V dc-dc converter, 20A $80, 24V-12V dc-dc converter, 10A $50, Rob VK4SEA or Robyn VK4RL (07) 4928 1700

Sell: Icom R-2 Rx little used, as new condition, original carton, excellent performance audio. 495kHz-1309MHz +Handbook, Personally provided carrying case, BNC connector for antenna, Reasonable offers neg. Keith VK3MDH (03) 9570 7592

Sell: Yaesu FT-920 HF&6m Tcvr, 100W auto atu, many features, VG, Handbook, Mic, Cables, Carton, $1700 David VK2BDT (02) 4821 5036

Sell: Magazines: -Radio and Hobbies (about 10 issues) 1949-1950; Popular Science Educator (about 20 issues) 1935-1936, fair condition. Best offer (Victoria) (03) 9795 1441,or email kentow@connexus.net.au

Sell: 60ft aluminium lattice tower kit [ATN] partly constructed.Could be transported in New England area for small addition. $500. Roger VK2FGE, 02-67-727840, or rchubb@ceinternet.com.au

Sell: ICR75 Icom 0.30-60MHz, mint won at local ham fest. body corp says no ants allowed in this home estate.rrp $1575 sell, $900 unused. neil 07 5594 1984

Sell: uniden ubc248clt 50 ch scanner with ext. whip antenna good condition $100. wanted: president washington ssb base cb, pll02a radios in good condition, 20-40a 13.8vdc power supply. will pay good prices. damo_ss@hotmail.com or 0421520410

Sell: Antenna, ATN 13-30-8, Log Periodic suited for 13-30 MHz, Antenna Rotator medium duty, preselect controller with 30 m of cable and tower top thrust bearing. Please contact Karl, Ph: (07) 3823 4919 or E-mail: vk4cws@iprimus.com.au

Sell: Power supplies, regulated DC, Lambda LMF15V, 8-18VDC@28A, $150, Lambda, LMCC15, 9-19VDC@6A, $80, both in EC and have overload protection and manuals, located in Melbourne, pictures at http://member.melbpc.org.au/~galston.

Sell: Microwave Developments 12 slot, horizontally polarised, omni directional slotted waveguide antenna tuned to 1283MHz. The antenna is brand new, powder

CAVEAT EMPTOR — BUYER BEWARE

The acceptance of classified advertisements in the classified advertising section does not warrant in any way that the goods offered are available, free of any encumbrance, in working order or otherwise satisfactory. The purchase of goods by private sale does not offer the purchaser any protection under law, and buyers should be certain the goods under consideration are suitable for the purpose for which they are required. ESR magazine cannot accept any responsibility for goods advertised in the classified pages and no correspondence will be entered into regarding such goods.

The onus is on you...the buyer - to beware!

RADIO-ADS Classifieds...

coated white, 185cm long, a gain of 10.5dbi and will handle 75 watts RMS. Perfect for an ATV repeater or beacon. Will sell at cost $300.00 firm. Please call Steve VK5SFA 0418 657 658

Sell: Codan 8528 in excellent condition $750 Gordon VK4FO e-mail vk4fo@caboolture.net.au or 0403077028.

Sell: Antenna 8-ele Log periodic, 13-30 MHz, sell $ 650.00 Antenna rotator by Create, medium duty, with preset controller and 30 m cable, sell $ 750.00 Karl, (07) 3823 4919, Capalaba. E-mail: vk4cws@iprimus.com.au

Sell: Magazines, Most issues of CB Action (Jan '89 to Oct '91), Amateur Radio Action (Sept '89 to June '95) and Radio & Communications Mag (July '95 to April '99). Over 100 mags available, all in excellent condition. $2.00 ea (plus postage costs) or the lot for $90.00, (plus postage costs). Contact Glenn (VK3UGC) for more details on 0414445597, or corrieg@bigpond.com

Sell: Icom receiver IC-R75, 30kc-60MHz all mode.mint cond won at hamfest. not a mark,where i live,body corp says i can not put up long wire so it has to go.rrp is $1675 and sell for $850,in australia i will pay shipping. NEIL VICKERY 07 5594 1984

Sell: Realistic DX 394 communications rx. Freq. coverage: 150kH/z - 29,999MHz. AM/CW/USB/LSB. Full details and report on request. As new in original packing with manual. $220.oo Contact John VK2GQK jwallvk2@tsn.cc or tel/fax: 02 6568 3323

Sell: Icom IC-737 HF XCVR. / PS-55 AC Power supply perfect condition with recent service / necessary replacement components by Icom dealer $700 with instruction manual & schematic diagrams: telephone (07) 4775 6579.Facsimile (07) 4775 3579. or e-mail matman@bigpond.com

Sell: UHF CB 5W handheld GME Electrophone TX6000. Includes AC and DC chargers, battery eliminator, speaker/microphone, leather case. Also will include quarter-wave and 9dB antennas with magnetic base. $400. Chris 0411 074 302. chris@levingston.net

Sell: Short wave receiver Sangean ATS 505. As new, includes protective case and reel antenna. $150. Chris 0411 074 302. chris@levingston.net

Sell: Kenwood TS44OS with inbuilt antenna tuner reason Call for price Allan 0429 654 270

Sell: Satellite Phone. Nera WorldPhone as new with accessories and optional antenna extension cable. Handles voice, fax, data on Inmarsat network. Best offer. Greig (02)6231 5765.

Sell: Microwave Developments 12 slot, horizontally polarised, omni directional slotted waveguide antenna tuned to 1283MHz. The antenna is brand new, powder coated white, 185cm long, a gain of 10.5dbi and will handle 75 watts RMS. Perfect for an ATV repeater or beacon. Will sell at cost $300.00 firm. Please call Steve VK5SFA 0418 657 658

Sell: Kenwood TS-43OS HF TXCVR With all optional filters installed instruction manual and service manuals. All in excellent condition. $750 O.N.O john VK5KBE 0412 000 076

Sell: Kenwood R5000 Communications Receiver and manual ser no 80500034. Mint cond. Dec'd estate $650 O.N.O. Ted VK3ALT QTHR. (03) 5941 1248.

Sell: Kenwood 120s HF radio for sale Excellent condition $295 ono Call Alex on 0405 567 690 Sydney NSW

Sell: Kenwood TW4000 VHF/UHF excellent receiver for noisy sites, will eliminate pager interference (IMD)UHF works low power only,bargain @ $195 Call Alex on 0405 567 690 Sydney NSW

Sell: Yaesu FT817 all mode QRP rig. Covers 160-70. Perfect condition c/w internal nicad battery pack, manual, ant, and box. Still under warrenty. $1075. VK3SR 03 9481 8482, 0439 400 320

Sell: Diamond D130J discone ant. Covers 25-1300Mhz c/w 15M Rg213 co-ax. Perfect condition. $165. VK3SR, 03 9481 8482, 0439 400 320

Sell: new IC756 PRO11 Icom base station no power supply $3200 Barrie VK4ALK

Sell: Communication Receivers, Kenwood R5000 $350 Realistic DX-160 $75. Handheld UHF 40 CB's Uniden UH-055 $150 Icom IC40G with Speaker Microphone $225. Handheld Scanner Icon IC-R10 cable and computer software $350. All in excellent condition with manuals (03) 9547 4892

Sale:YAESU FT-1500M 2M XCVR Perfect Condtion $300ono Magellan Meridian GPS almost new offers DSE AM CB new $50ono S-Adams Ph:(03) 6244 7403

Sale Tektronix Ociloscope Type 535A with plugin module B dual channel type CA with manuals $100 Scope Mobile type 500/53A $50 Rod VK2CN Ph: (02)49448393 QTHR

Sell: MFJ Sound Card Radion Interface Cables Documents Posted $110 MFJ Speech Intelligibility Enhancer cables Documents Posted $110 PAKRATT PK232 cabes Manual posted $110 A.Cory VK2DTH Email: gpcory@bigpond.au Ph:(07) 46763153

HF Antenna Cushcraft A352KW 20/15/10 meter beam 9 month old VGC $630 Jim Ph: (03) 93676920

Sell: DX100 SW Radio $120 Scanner 200chn Netset $200 National Panasonic Radio SW 31 Bands $150 Barlow Wadley Radio 31 bands $350 R.P. White (02) 93651992

Sale:Tower EX SES 2 Section each 27 feet heavy galvanised triangular section top section will fit rotator inside $150 10mtr linear 50watt TiaraII $50 YAESU FT7 with circuit Ex Cond $200 Email: dgrant@netcon.net.au Ph: 054751174

Sell: Good sanyo Transworld reciever model 17H-815 outlet for extra antenna aerial fine tune knob missing otherwise okay cheap $60 Ph: (02) 67363923

Sell: Kenwood Transceiver TS-440s with inbuilt auto antenna tuner fully seviced and checked by Kenwod original box and users manual serial no. 7120301 $750ono like new. Contact Keith on (03) 5995798 Mob: 0412428606 All hrs Email: sadler2@optusnet.com.au

Sell: YAESU FT90R 2m/70cm Dual Band wide band Rec. T/ceiver. As new Boxes manuals $525 YAESU FT400 T/ceiver ideal spare parts $125 Chirnside CA33 10/1/20 Tribander $125 Allen Ph: (03)63271171 Mobile 0419 755124

Sell: YASU FRG-7 RX VGC $120 Warren (07) 33447179 Brisbane

Sell: Communication Recievers, Kenwood R500 $350 Realistic DX-160 $75. Handhald UHF 40 CB's Uniden UH-055 $150 Icom IC40G with speaker Microphone $225. Handheld Scanner Icom IC-R10 cable & computer software $350. All in excellent condition with manuals Ph: (03) 9547 4892

Sell: All UHF/HF Gear, 3 Rotators, Many Beams, radios, Kenwood Antenna Tuner. Tower. Everything to go. $2000 Michael. Narrandera NSW (02) 6459 3924 or 0418 431 739 or old@dodo.com.au

Sell: Tokyo Hy-power HL-180v Amplifier Tx/Rx for 2m 180W. Near New, little use, origional box, manual, $550 ono Doug 07 3391 5526. friends@squirrel.com.au

Sell: Kenwood TS-690s HF+6m Xcvr excellent condition. Does not have ATU $1250 VK3DTO 03 5382 1759

Sell: Kenwood TS-2000 As New superb Xcvr, All HF Bands +6m +2m +70cm. 100W Out to 2m Built-in ATU Full DSP, Working TNC Plus extras. 2 Speakers, MC60 Desk Mic, Good Value -call for price. Retiring Amateur. 07 5537 2376

Sell: Tektronix/Telequipment D83 50MHz Dual Ch CRO. Two brand new Konig probes with Receipt. on adjustable trolley. GWO $350 Bruce 03 9850 2134

Sale:Vibroflex Vibrokeyer Delux , SN 389009 $150, Vibroplex Double Key, SN100061 $300, NYE Master Key, Model 330-001 $100, TEN-TEC Electronic Keyer, Model KR-5A $100, Matching of German Miniature Keys, 1 single-action, 1 double-action, brass-handmade, rare $200, Linear Amplier, 3-30 MHz, 3CX300A7, 3phase. Harro, VK5HK Ph 08 8323 9622, Fax 08 8323 9659

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ESR magazine cannot take responsibility for ensuring that all advertisements submitted in this magazine comply with the Trade Practices Act 1974. Advertisers and their agents must ensure that they are aware of the relevant regulations under which they operate and comply to such regulations. ESR magazine requires contact details from all advertisers including place of business where applicable.

RADIO-ADS Classifieds . . .

For Sell: BOOK: "Radiotelegraph and Radio-telephone Codes, Prowords and Abbreviations" 3rd Edition (236pages), 610 gm, 1.5 lbs, now available. Probably the World's best compilation of this info now available. Q,X,Z Codes, 142 Phonetics, 24 Morse, 8 Needle codes. Myer, Phillips, 10, 11, 12, 13 and other codes. Much other info, abbreviations, procedures and methods. AU$25 + P&P. (in Australia $7.50) Internet: http://www.sarc.org.au then hit "Code Book ...." John Alcorn, VK2JWA, QTHR, Ph +61 - 02-66215217 vk2jwa@sarc.org.au

Australian Radio DX Club Inc.

The premier club in Australia, since 1965, for shortwave, broadcast band and utility listeners (military, marine air, etc.). Contact John Wright, 15 Olive Crescent, Peakhurst NSW 2210. dxer@fl.net.au A free sample copy of the club's magazine will be sent on request. Reg A0011728G.

SWAP:

Swap: Early 1950/60s valve Communications receivers, National HG88, Eddystone 840C, Hallicrafters SX-100 etc. for early Hi Fi valve amps/pieces, speakers, transformers, valves. John (02) 9440 1267 Email: johnmurt@highprofile.com.au

Swap: I'll give you back the beer I drank last night if you take the headache that goes with them. see Chuck

WANTED:

Wanted: any battery/antenna/charger/speaker mike/instruction manual or accessories to suit ICOM IC40 UHF HAND HELD transceiver.Ray.03 5996 3137 or ray@melbpc.org.au

Wanted: 2m or 2m/70cm dual band base station transceiver. Please forward details to VK 3XK c/-ghkinge@hotkey.net.au

Wanted: Copy of Instruction Book for Kenwood Automatic Antenna Tuner Model AT 250. Will happily pay all costs. Please contact Graham, VK3XK at ghkinge@hotkey.net.au

Wanted: HammarlundSP-600J(X) comms Rcvr. GWO if possible please, Can collect reasonable distance QTH, Otherwise will pay Freight. Terry VK3DWZ (03) 5427 1574 Woodend, Vic.

Wanted: Handbook/circuit THP HL110V 2m amp; handbook/circuit Alinco ELH-230 GII 2m amp; Kenwood MC60A Mic; Icom SM8 Mic. All costs covered. John VK1CJ ronjon@wic.net.au (02)6251 1816

Wanted: Circuit or Service Manual for Alinco DJ100T –Please no BS about 100Ts. Stephen VK3TSA 0419 378 712 smhunter@acepia.net.au

Wanted: Icom AT150 Antenna Tuner, PS55 Power Supply, David (03) 9560 9435, davidsyeo@hotmail.com

Wanted: Circuits and owners manual Microlog AIR-1 CW/AFSK/RTTY module for Commodore64 -copoes OK. Circuits and owners manual Yaesu V/u transverter model FTV-700 copies OK, will cover costs. Brad Booth VK4CDL 48 Gregory St, Cardwell 4849

Wanted: Any info to help me rejuvenate a CPI CP-300 CB Radio. Need the Manual, Circuit Diagram, etc Even a knowledgable Tech would help! David (03) 5255 1188(H)

Wanted: 2m/70cm Dual Band Antenna 144-148MHz/430-450MHz or similar. Mike VK7ME (03) 64381217 Fax (03) 6438 1502

Wanted: 70CM Linear amplifier for ATV use. 10 to 20 watt output required. Up to 1 watt of input drive is available. Steve VK5SFA phone 0418 657 658 anytime.

Wanted: Pro 005, 006 handbook, and back lit lcd display unit [green light] will talk about costs Neil 07 5594 1984 Carrara 4211

Wanted: Schematic diagram of Uniden CR-2021 Shortwave radio. Happy to reimburse any costs. Craig VK5ZAW cwm@picknowl.com.au

Wanted: Schematic for an Alinco 110T 2Mtr Radio. I am setting up for IRLP and the radio needs some work. I would be pleased to cover your costs.KEITH VK2CKH. (02) 4446 5659

Wanted: Yaesu FT-901/902 transceiver in any condition. Phone 02 48447147. Richard VK2ERF.

Wanted: HF Tranceivers, HF Ampliers. 2m Mobile FM Transceivers. These items are for DU HAMS. So keep prices down, as most don't have alot to spend. Please send response via e-mail to Chris VK3FY at chrisdim@bigpond.com

Wanted: ALPHA 77Sx, HENRY 8k CLASSIC or similar amplifier. Single or 3 Phase power source is okay. Send responses to Chris VK3FY at chrisdim@bigpond.com

Wanted: Pactor-III modem (or similar) for connection to Kenwood TS-50 HF transceiver. Contact 0427 749 609 anytime, email: yachtamaroo@bigpond.com.au

Wanted: Automatic ATU mobile whip antenna for Q Mac AF 90 HF radio or any suitable AATU for mobile use. Ray. rskarbek@bigpond.com or rom@melbpc.org.au or 03 59966106

Wanted: Any communication equipment (free)working or not by mature aged and poor electronic trades student. Will pick up Sydney metro area. Thanks. Bill 02-9623-8406

Wanted: British Army transceiver VRC353 in good working order to complete my Daimler Ferret Mk 1/2 Scout Car. If you have one of these and are willing to sell it please contact me by phone (0439 476 255) or email howard@small.com.au

Wanted: C42 or B47 military vehicle radio for display purposes only. ie Need not work. For Ferrit Mk I Scout Car for South Australian Museum. (non-profit organisation) Command set and/or Squadron Set. Contact Ron Oxer (08) 8240 0754 oxr@optusnet.com.au.

Wanted: Any Amateur who has experimented or is receiving World Space Radio Transmissions. Andy vk3dto@amsat.org 03 5382 1759

WANTED KNOWN:

Radio Scanning Yahoo Group: radioscanaus, Post message: radioscanaus@yahoogroups.com, Subscribe: radioscanaus-subscribe@yahoogroups.com paul.blundell@education.tas.gov.au

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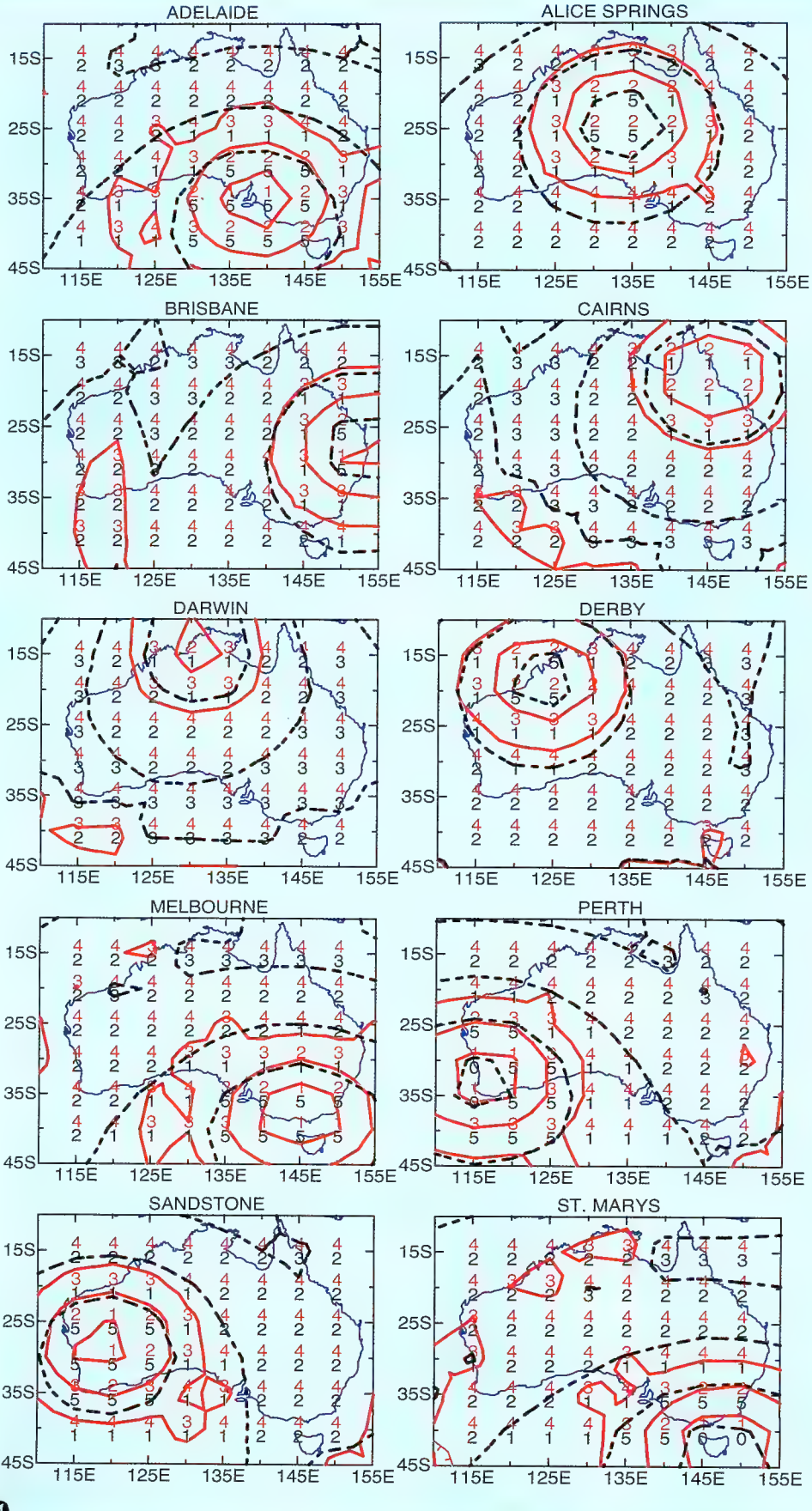

ABOUT THESE CHARTS

The charts on these pages show the IPS forecasted HF operating conditions within Australia, and between Australia and a number of overseas destinations.

The information and charts are prepared by **IPS Radio and Space Services**, a division of the federal Department of Industry, Science and Resources. **IPS** monitors changing radio conditions which are most effected by fairly predictable changes in solar activity. IPS issue reports and warnings based on that data.

How to read the charts on this page:

The charts on the left show the optimum frequencies for HF communication between the nominated center and other parts of Australia.

Most of the chosen locations host **VKS-737** base stations so the numbers on the charts correspond to VKS-737 channels. The VKS-737 channels are: **Ch1**: 5455 kHz; **Ch2**: 8022 kHz; **Ch3**: 11,612 kHz; **Ch4**: 14,977 kHz; **Ch5**: 3995 kHz. Note that the channels are slightly out of order frequency-wise.

The optimum day-time channels are shown in red, and the night-time channels in black.

Choose the chart nearest your location on the map, then select the day or night channel that is printed at that point on the map for communications with the base station or other stations in that area. For sunrise/sunset periods, you may need to try a channel-frequency that is mid-way between the day-time and night-time channels shown.

For Amateurs use the band nearest to the given channel frequency. If the best channel is 8022 kHz, you'd use 40m, and so on.

How to read the charts on the next page:

The charts on the adjoining page are specifically aimed at Radio Amateurs communicating between Australasia and other continents. The charts cover all frequencies to the 6m amateur band and apply to stations in all parts of Australia, New Zealand and near neighbours.

The horizontal axis of each graph represents the hour of the day expressed in Universal Co-ordinated Time or UTC ('z').

The vertical axis shows the entire HF spectrum with a horizontal line representing each current HF amateur band.

To read the maps, first choose a map which includes the area in which you are interested. Assuming you want to choose the best band to operate on, look in the blue OWF portion and select a band/frequency from the vertical scale. Otherwise, if you want to communicate with an area on a particular band, select the band and look across the chart for the best times as shown on the horizontal scale. The charts can be used for contesting to plan when to shift the beam or change bands. ***Note that progagation doesn't always go to plan though.***

If the space is blank the forecast is not good — your time and frequency combination is unlikely to allow communication to the destination station. If a particular frequency band is indicated as not propagating, try a frequency that the charts suggest as being more suitable.

Your questions, comments, requests or recommendations about these charts are welcome.

Please write to :-
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PO Box 288, Beerwah, QLD 4519
or email editor@esr-mag.com

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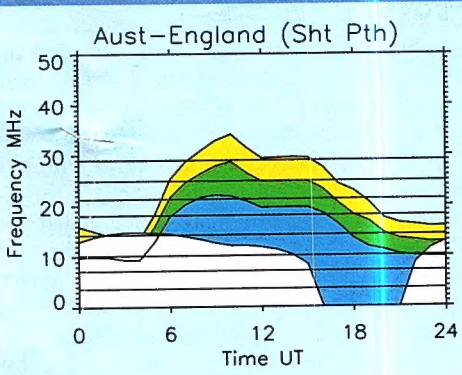
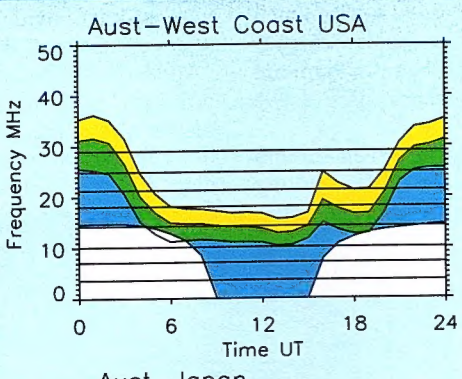
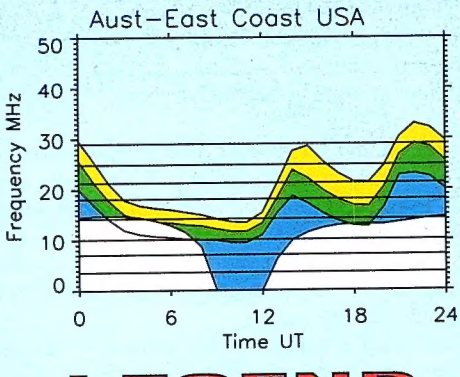
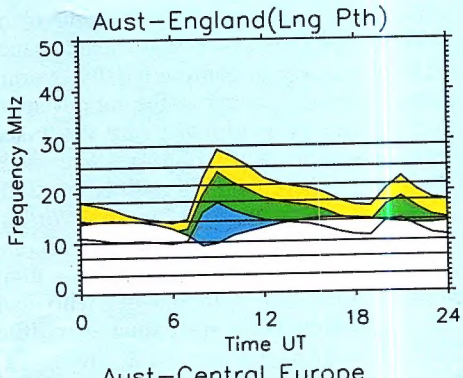
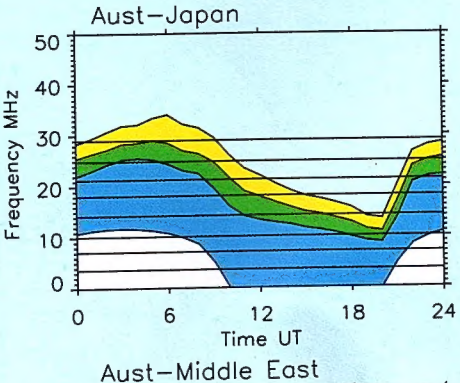










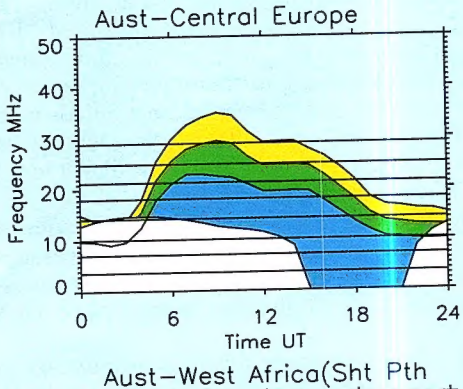
LEGEND

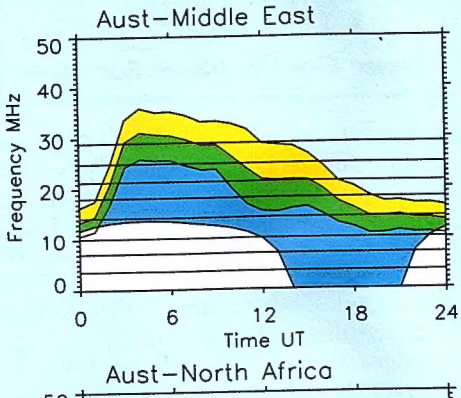
UD - Upper Decile
-You have a 10% chance of getting through.

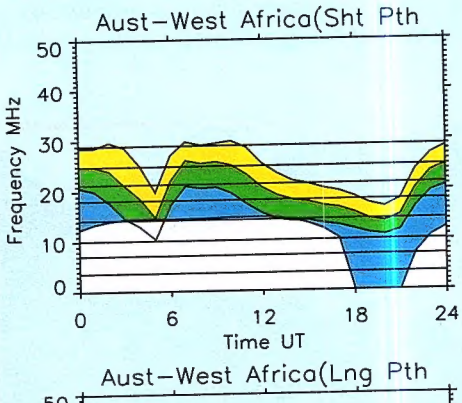
MUF - Maximum Usable Frequency. 50% chance of getting through.

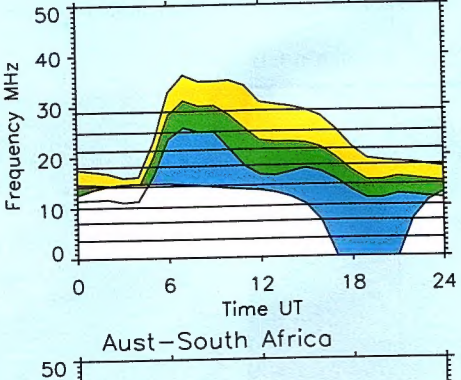
OWF - Optimim Working Frequency. 90 % chance of getting through.

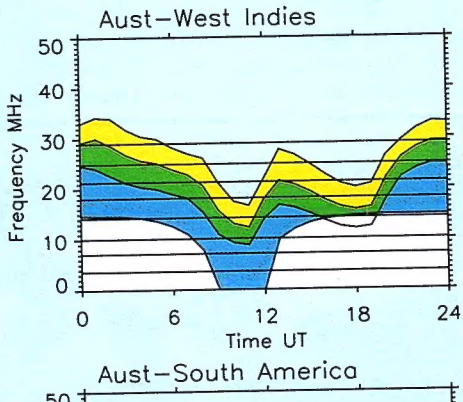
ALF - Absorption Limiting Frequency. Lower limit of the usable band.

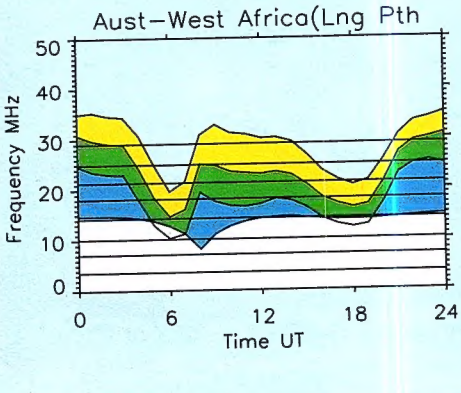


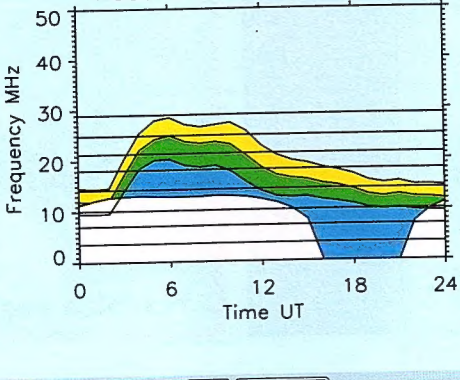


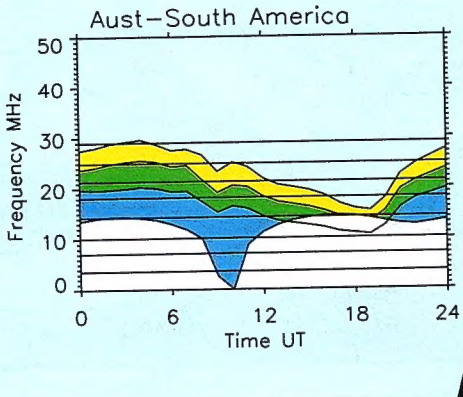












The Tale End

Here we are at the end of another issue, the second issue of ESR, and I haven't stopped, whew! I hope that you enjoyed this issue as much as I enjoyed bringing it to you, and I look forward to doing the next issue —beginning tomorrow!

Those who have been around awhile will have noticed that whether it's the Pix-People, Women's Day, or another of your favourite magazines, the back page is often a place for humour. Perhaps it's the concept that many "Public Speakers" use, –leave them laughing!

The name "The Tale End" seems appropriate, even though I'm sure to receive emails pointing out the error in the spelling of "Tale", or rather the selection of the wrong homonym. Well it is meant to be the TALE end as that's where the tall stories and Tales are going to be featured. It didn't seem right to call it the BS page,

So what I want you to do is send me the lighthearted happenings in Radio that you spot or hear over the air, or find on the net, words and/or pictures, even the occasional cartoon.

NOTE: I prefer to know the parentage of the items where possible as I am sure we all recognise the cartoon on this page, but doubt that any of us know where it originally appeared. It has been photocopied and traced so many times that we all think we have seen the original, but I have never seen it with a signature.

The copy I have here was sent to me by a reader who suggested it might apply to ESR, or perhaps the band of writers who persist in bringing you the magazine you asked for. Either way, I like it!

Beware the PTT!

I see that some yuppy advertising guru has heard the many stories of people activating the PTT button of a microphone at the wrong time. On TV, the ad suggests that the mobile phone was so poorly laid out, or so automatic, that a couple accidentally dialed a friend just as some embarrassing comment was made.

This is a stretch of the very familiar story where a microphone is keyed up just as some embarrassing comment is uttered.

That's probably why OMs use CW! -they learned the hard way! Note the operator below who doesn't even stop sending to eat. This is either a good indication of CW skill, or a man enthusiastic about his eating. (We're mates right!!! -ed)

I have been at the Drive-in Theatre several times when a CB mic was (in theory at least) accidentally turned on as some poo girl shared a magic moment with every CBer in the theatre, an of course every CBer within range of the signal. Perhaps it wa simply a "I love you" type of comment, but more commonly i was sufficient evidence to instigate divorce in a marriage.

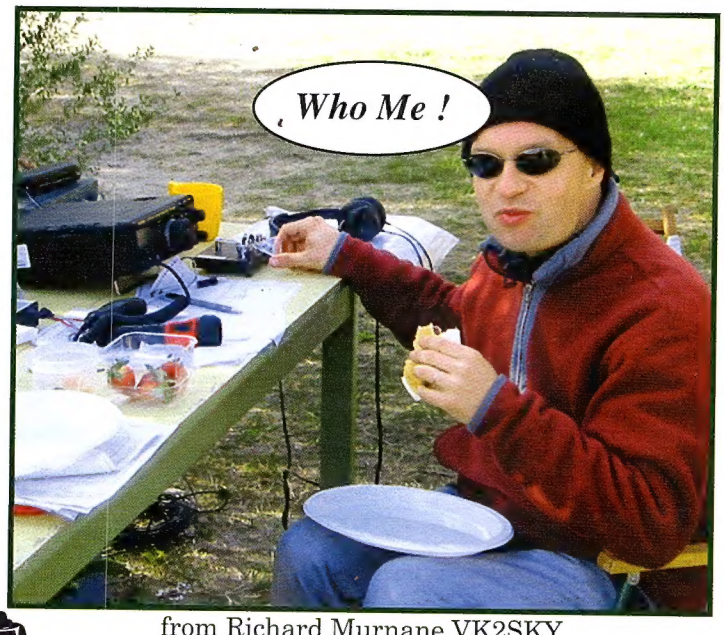
CBers are not the only ones to be caught however, and the "Apollo 13" movie introduces the general public to VOX technology (Voice Operated Transmit). I have heard one amateu on-air who apparently forgot to turn his VOX off when his wife delivered his coffee to him. A breaker tried several times to alert him to the mistake as members of the net were waiting to start. Finally the Amateur concerned found himself unable to face the net that evening, and received a round of applause at the next meeting when a few more members had become aware of the amorous operator.

I've also heard stories of one telecom technician unwittingly broadcasting from his van during his lunch hour in Brisbane, while obviously accompanied by a non-telecom person. I suppose the moral, apart from the morals, is to make sure you place the microphone in it's clip or some other safe place! -where the PTT can't be pressed!

Almost as dangerous as inadvertant PTT operation, is the unintentional second operator. I had a discussion with a coal mining supervisor (Open Cut) who had called up one of his staff on the mobile asking to talk to one particular employee. The guy on the other end answered "I'll get him for you..." and left the button down as he called out to the other employee. A short two word response was yelled back, collected by the open mike, and transmitted to the supervisor, who thankfully took it all in good humour even if he didn't let on to the miner when he finally spoke with him, in person!

Finally, the image below was recently emailed to me, without explaination, or source. The two gentlemen below are perhaps military, perhaps European (or UK) but judging by the expression on their faces, there is some pride taken in the size of one's final tube!

(Please, if you're going to send items for the magazine, try to make sure to include details of the source and any copyrights!)



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